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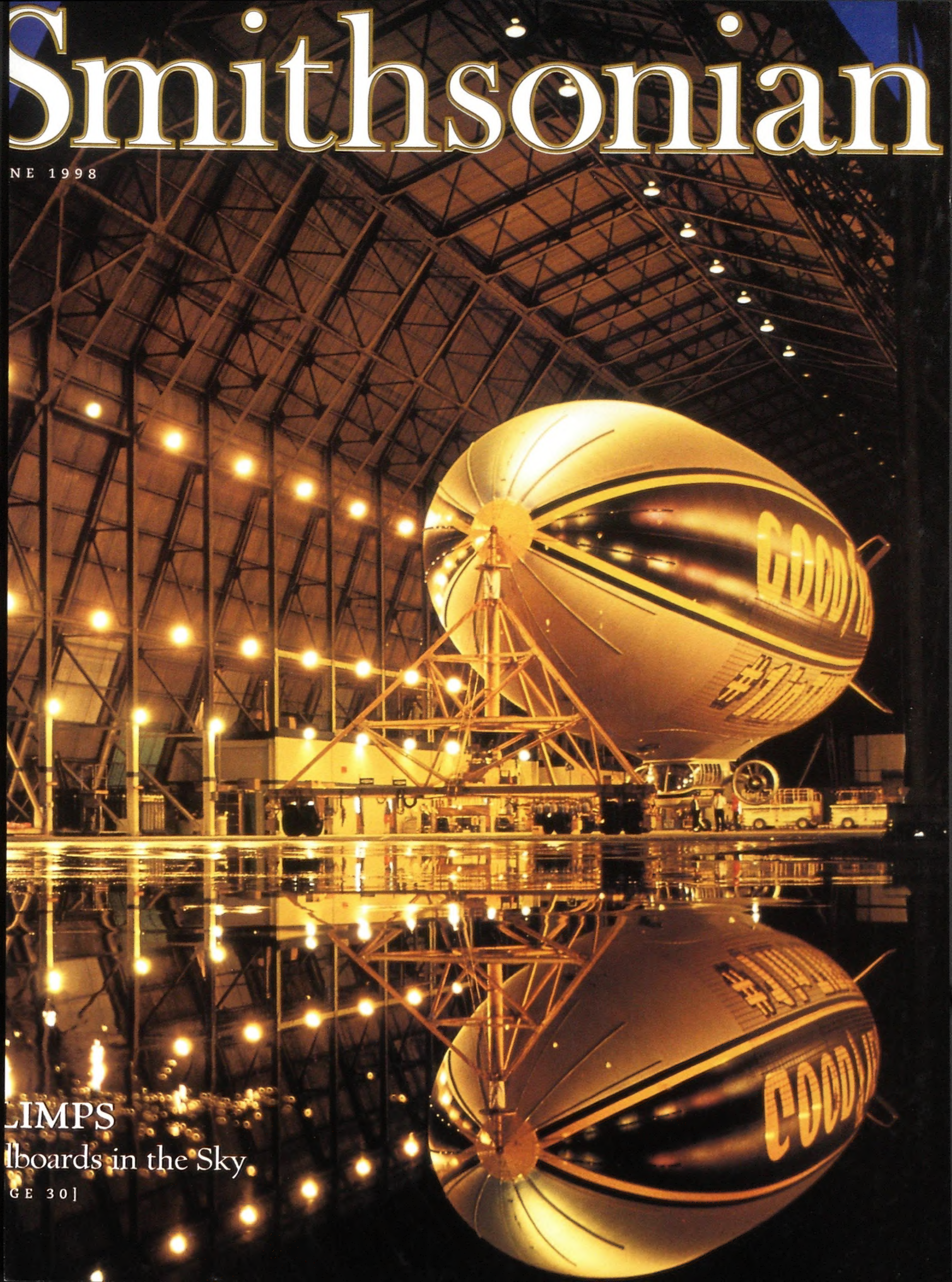

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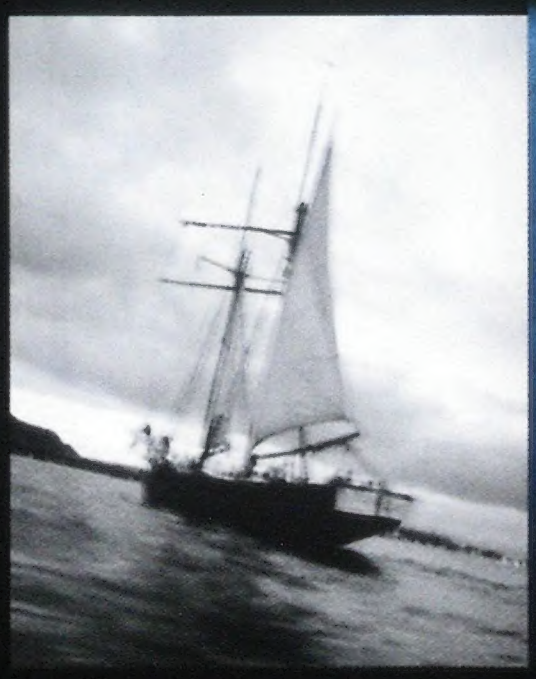

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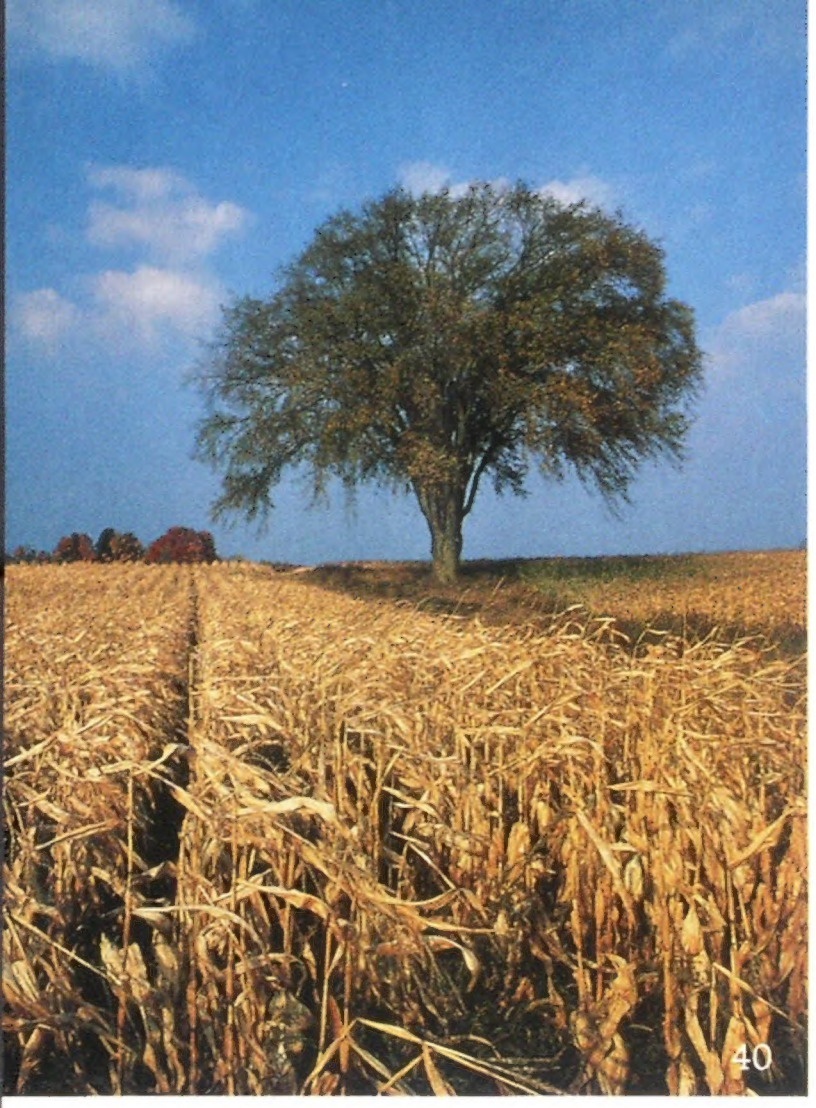
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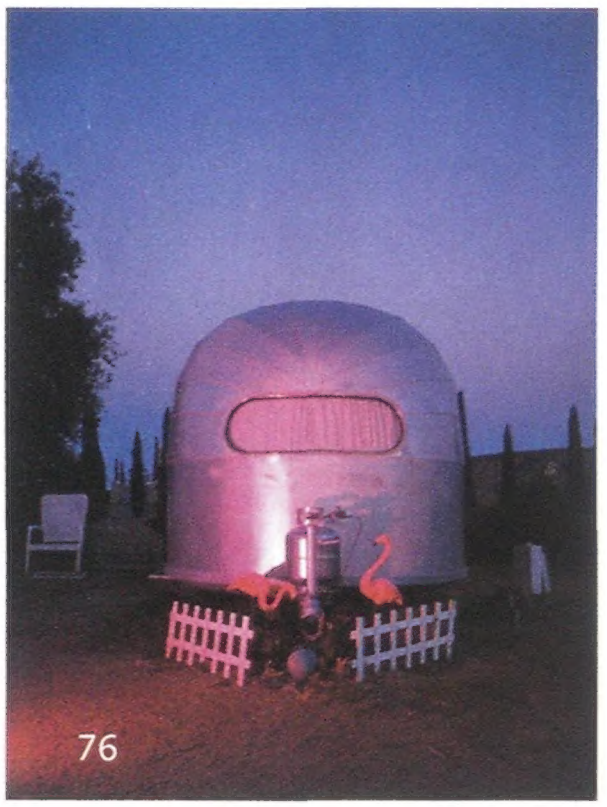
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departments

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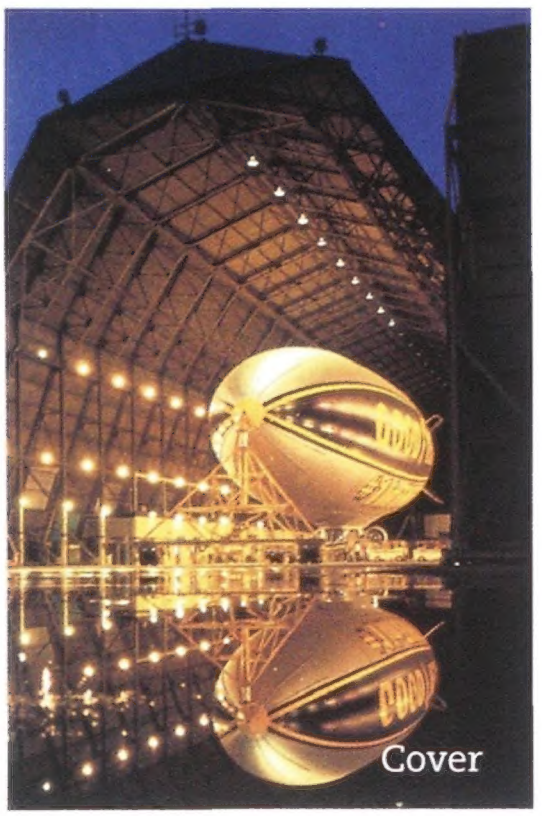

Cover Goodyear's *Spirit of Akron*, the largest airship flying in the United States, and the world's biggest blimp, is reflected in wet pavement outside its hangar at Wingfoot Lake, near Akron, Ohio. The blimp is kept inflated and anchored to the yellow mast when not in use.
PHOTOGRAPH BY CHAD SLATTERY

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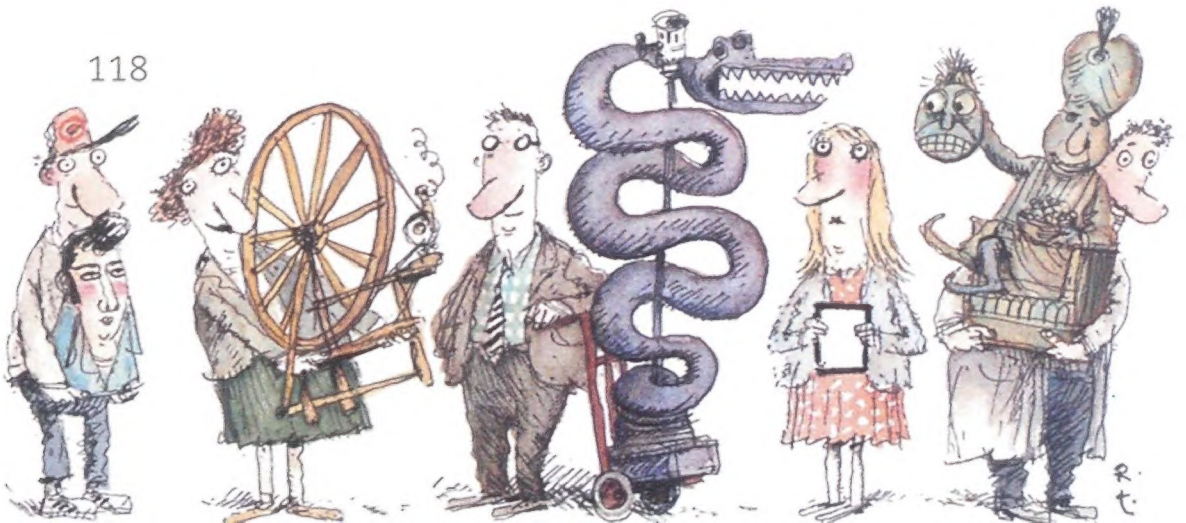

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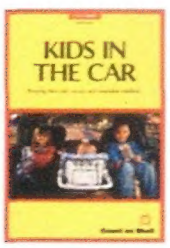

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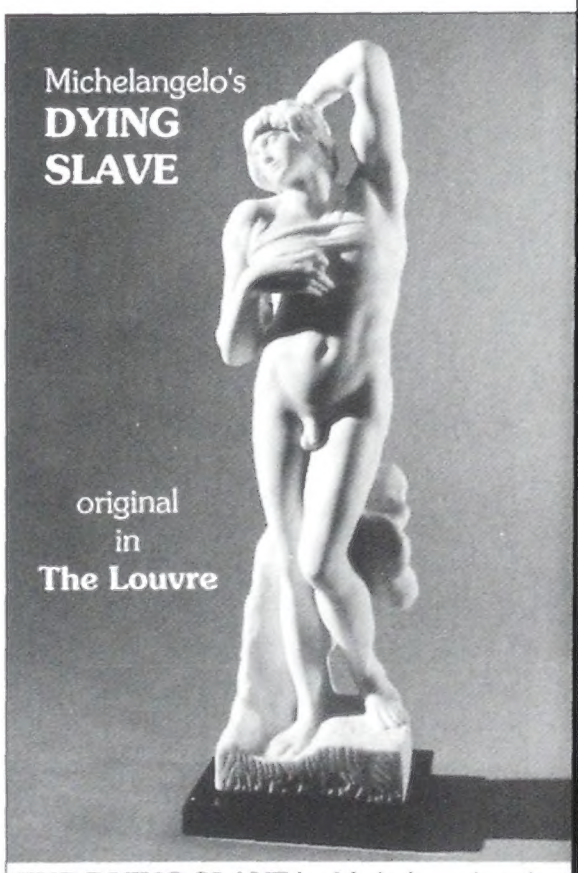

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SMITHSONIAN

PERSPECTIVES

Charting a New Course

ESTABLISHING A PERMANENT MARINE STATION HERALDS AN ERA OF PROGRESS FOR SMITHSONIAN RESEARCH

IN MID-MARCH, THE INSTITUTION BROKE GROUND ON an 8,000-square-foot laboratory building that will become the new home of the Smithsonian Marine Station at Fort Pierce, Florida. This occasion begins a new era for marine biology at the Smithsonian.

For 25 years, the Marine Station, a research facility of the National Museum of Natural History, has conducted marine studies from a floating barge of World War II vintage that's docked at the campus of the Harbor Branch Oceanographic Institution in Fort Pierce. This cooperative relationship has been very beneficial, but to accommodate our growing program we need to establish our own permanent site. Assisted by the MacArthur Foundation, in 1996 we acquired eight acres near the Fort Pierce Inlet, on a barrier island between the Indian River Lagoon and the Atlantic. The 156-mile-long lagoon, the focus of much of our research, is a coastal estuary that encompasses extraordinary diversity in marine life.

The Smithsonian Marine Station, directed by biologist Mary Rice, has long been a magnet for scientists from the Institution and the world because it offers a unique transition zone between temperate and tropical waters. Equally important, the station forms a vital link in an elaborate "necklace" of Smithsonian coastal research stations that stretches from our Environmental Research Center on the shores of the Chesapeake Bay to our Tropical Research Institute in Panama. Collectively, these stations allow our scientists to compare environmental trends across a wide range of latitudes and combine expanding knowledge about natural history and marine ecosystems in new and exciting ways. The Florida site provides ready access to an incredible array of habitats, including mangroves, marshes, sea grasses, tidal flats, reefs, sandy beaches and waters of the continental shelf and the Gulf Stream.

More than 70 percent of the world's population lives in coastal areas that are subjected to natural changes that have an increasingly dramatic impact on human lives. Understanding such areas has far-reaching consequences for land use, economics and social development. The Marine Station contributes to our knowledge by examining one of our most biologically productive but fragile systems, the Indian River Lagoon.

Research at the Marine Station emphasizes biodiversity of marine organisms, including life cycles and ecology. I am informed that researchers explore the most fundamental processes of growth, from single-celled eggs to exotic larval forms that float in the plankton and replenish the lagoon. Aboard the research vessel *Sunburst*, scientists sample planktonic larvae from the lagoon and from the Gulf Stream. Using fine-meshed conical nets, they collect fantastic squid larvae with big eyes and tiny suckers, worm larvae spinning like pinwheels, and tiny crab larvae with long spines. Scientists study transformations that reveal the amazing mechanisms of cells, which in turn provide clues about how populations of crabs and other species in the coastal food web are regulated.

Our very capable taxonomists provide comprehensive analyses of biodiversity in Florida and throughout the Caribbean. Recent studies focus on marine algae, sea stars, sea urchins and marvelous burrowing shrimp. In addition, the Smithsonian Marine Station is the home of the Indian River Lagoon Species Inventory, which documents the nearly 3,000 species of plants, fishes and invertebrates that make biodiversity in this estuary the highest in the United States.

Ecologists from the Smithsonian Environmental Research Center on the Chesapeake, one of the links in our connecting research stations, are conducting studies of blue crabs in the lagoon. With new funding from the National Science Foundation, they are able to compare patterns of blue crab biology in Florida with those of Maryland's heavily fished population.

On the diffusion side of our mission, the Marine Station's new site will allow us to bring marine science into the everyday lives of local schoolchildren and involve Florida's senior citizens as docents and volunteers. The station also hopes to expand its professional training programs for young scientists. Over the years, the station's scientists have served as mentors to more than 100 students from around the world, helping them launch careers in marine biology.

The biological richness of the famed "Treasure Coast" of Florida is critical to the hundreds of thousands of citizens who derive recreation and livelihood from it. The Marine Station attests to our active involvement in local, state and regional environments and underscores the Smithsonian's commitment to understanding marine ecosystems globally. In a wonderful way, the station's emergence from a floating sea base to dry land at Fort Pierce heralds the next chapter in the Institution's exciting history in marine biology. Our future in the Sunshine State could not be brighter.

I. MICHAEL HEYMAN, SECRETARY

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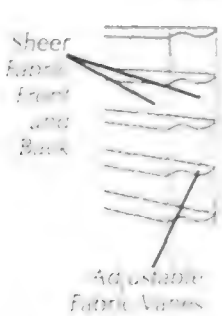

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NURSING

IT WAS INSPIRING TO READ IN YOUR April issue about my nursing colleagues in Joyce and Richard Wolkomir's article "The Quality of Mercy." The touching photography by Lynn Johnson at the Central Vermont Medical Center clearly captured the essence of caring. Nurses can be ordered to care, but the nurturing spirit must come from within each of us. It involves more than changing a dressing or performing some task: it includes empathetic listening, a comforting presence, a gentle touch and the many other inestimable acts of humanity that cannot be tacked on to the hospital bill.

As an oncology nurse for 25 years, I have lived the experiences so eloquently expressed in your article. Life's most valuable lessons have been taught to me by people with cancer whom I have had the privilege to care for and care about.

Experiencing a serious illness is a difficult journey for any of us to travel. Nurses such as Alma Mueller [right] and Debbie Farnham, and physicians such as John Valentine, are the guides we need along this stormy path: they are true masters of the art of caring. Thank you for the excellent tribute to this labor of love.

Shirley M. Gullo, RN, MSN, OCN
Cleveland, Ohio

EVERY GOVERNMENT OFFICIAL WHO IS reviewing our health laws should read your article. The direction of managed care is eliminating the human element. Nurses are being stretched to the limit, with higher patient-to-nurse ratios and higher acuity levels, i.e., patients are more seriously ill when they are finally admitted. Because nurses have less time to carefully review all patient medical records, histories and new orders, errors are being made. To ensure that quality care is given, I believe that every inpatient should have an advocate—either a family member or friend—stay with them. We nurses know too much, and we're alarmed.

Heather Rockcastle, RN, BSN
Coral Gables, Florida

IN 1994, A SERIOUS CAR ACCIDENT left me with a broken hip, deep facial lacerations and the loss of two teeth. As I lay in the hospital's intensive care unit one night after surgery, I just couldn't sleep. A nurse truly nursed me. She came into my room and talked with me, and then she brought me a glass of warm milk. She soaked my hands in warm water and then massaged them. About an hour after those ministrations, I drifted off to sleep. These were not medical breakthroughs, but for me, during a most difficult night during my three-week hospital stay, they were more than consequential. I don't recall her name, but I will always remember her kindness and care.

Wynona M. Montgomery
Baytown, Texas

SPANISH CIVIL WAR

YOU OPENED YOUR ARTICLE ON THE Spanish Civil War with Robert Capa's most famous and most controversial photograph, that of a Republican militiaman at the moment he was killed. Despite Capa's repeated statements that he had been on the Córdoba front, questions remained about where Capa took the picture and whether or not he had posed it.

Recently, all questions about the photograph's authenticity were removed. A Spaniard originally from Alcoy, near the city of Alicante in southeastern Spain, named Mario Brotons Jorda, tracked down the identity of the "Falling Soldier." At 14, Brotons had joined the local Loyalist militia and had been at the September 5, 1936, battle at Cerro Muriano, on the Córdoba front.

Brotons recognized the distinctive cartridge pouches that the "Falling Soldier" wore, which had been specially designed by the commander of the Alcoy garrison and made by the local leather craftsman. He then went to the Spanish government archives in Salamanca and found that the only member of the Alcoy militia killed at Cerro Muriano on September 5 was Federico Borell Garcia, a 24-year-old militiaman from Brotons' native Alcoy.

Brotons took Capa's photograph to Alcoy and showed it to Federico's younger brother, Everisto, who had also been at Cerro Muriano on September 5. Although Everisto had not witnessed his brother's death, he told Brotons that the photograph conformed precisely with the verbal account he had been given at the time. He said the man in Capa's picture was his brother, and examination of other family photographs confirmed that Federico is indeed the "Falling Soldier."

When asked in 1937 about the authenticity of his famous photograph, Capa replied: "No tricks are necessary to take pictures in Spain. You don't have to pose your camera.

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The pictures are there, and you just take them. The truth is the best picture, the best propaganda."

Richard Whelan
Brooklyn, New York

Mr. Whelan is the author of *Robert Capa: A Biography*. The exhibition "Robert Capa: Photographs" will be at the International Center of Photography, 1133 Avenue of the Americas, in New York City, until June 7, 1998. Among the 160 photographs are 25 vintage prints by Capa from the Spanish Civil War and 12 vintage prints of the war by his friend Gerda Taro. The show will be at the Museum of Photographic Arts in San Diego from July 3 to September 8, and at the Terra Museum of American Art in Chicago from October 16 to January 3, 1999. Ed.

THE WOMAN LOOKING SKYWARD AS she nurses her baby in the photograph on page 113 was not "facing death" in Barcelona as your caption said. David Seymour, who signed his work "Chim," shot the picture in the province of Extremadura in spring 1936. The French weekly newspaper *Regards* published the picture in its May 14, 1936, issue, two months before the outbreak of the Spanish Civil War. The *Regards* caption explained that the woman was listening to an official in Madrid who was explaining the government's land reform program. In 1937, a Spanish propaganda pamphlet showed Chim's picture beneath a picture of bombers high in the sky. Ever since then, Chim's photograph has generally been accompanied by a caption similar to the one in SMITHSONIAN.

William Bee
Austin, Texas

TWO OTHER BOOKS THAT SHOULD BE added to your *Additional Sources* list are *The Odyssey of the Abraham Lincoln Brigade* by Peter Carroll and *Madrid 1937*, which is a collection of letters home from members of the Lincoln Brigade.

Peter Lotto
Clinton, New York

CRANES

OPERATION MIGRATION WISHES TO thank you for your article "Fly Away Home" by Adele Conover. Your story ends on a rather happy note with our sandhill cranes safely ensconced in their wintering ground in Virginia. The success of our experiment, however, is dependent upon our birds learning the migration route and returning to Canada.

All 13 birds seemed to enjoy their winter home under the stewardship of local biologist Kate Sutherland. Bill Lishman and I flew with the birds several times, and by mid-February it was time for their release. They made daily foraging trips but always returned at night to the safety of their pen.

Virginia experienced a very early spring, and the birds started wandering farther afield. After the chaos of a March 13 trip, we decided to divide the flock. As Adele reported, seven birds followed our ultralights to Airlie last fall, while six others protested their way south in the Operation Migration trailer. The Errant Six seemed to be the inhibiting factor. With the help of the Patuxent Wildlife Research Center, we found them a home in an Omaha zoo. On March 28, the remaining seven left Airlie of their own accord for parts unknown.

The spectacle of seven lone sandhills and an enthusiastic public have provided more accurate position reports than the satellite transmitters the birds carry. Doug Ransom, principal of the Gracefield School, called from St. Catherines, Ontario, on March 30 to report that six birds were entertaining 250 students before the start of classes. (Number 209, always an independent bird, must have left the flock to make his own way.) The six had covered 500 miles in two days and were now on the south side of Lake Ontario. By 8 P.M., the flock departed and made their way west around the tip of Lake Ontario, only 63 miles from home.

At 10:30 A.M. on March 31, Mrs. Pat Janse reported that six great birds "scared the life out of me" as they landed in her backyard in Holland Marsh, 35 miles west of home base. That evening, the sight of a local dog sent them airborne, headed east.

For the next nine days, citizens reported sightings of the flock, and we retrieved individual birds from such places as a soccer field in midgame and an understanding farmer's corn-filled barn. We've determined that our crane suits [pictured here with a real sandhill] were a bust.

By April 11, all six UltraCranes had landed at their fledging grounds in Scugog, Ontario. They have made friends with a wild sandhill who has already taught them to use the large wetland adjacent to their pen area, and who, we hope, may teach them that associating with humans is not appropriate crane behavior.

The experiment is a success. If the sandhills make it all the way, they will have covered 650 miles: a small flight for a sandhill but a giant step closer to the restoration of the endangered whooping crane.

Joseph Duff
Blackstock, Ontario

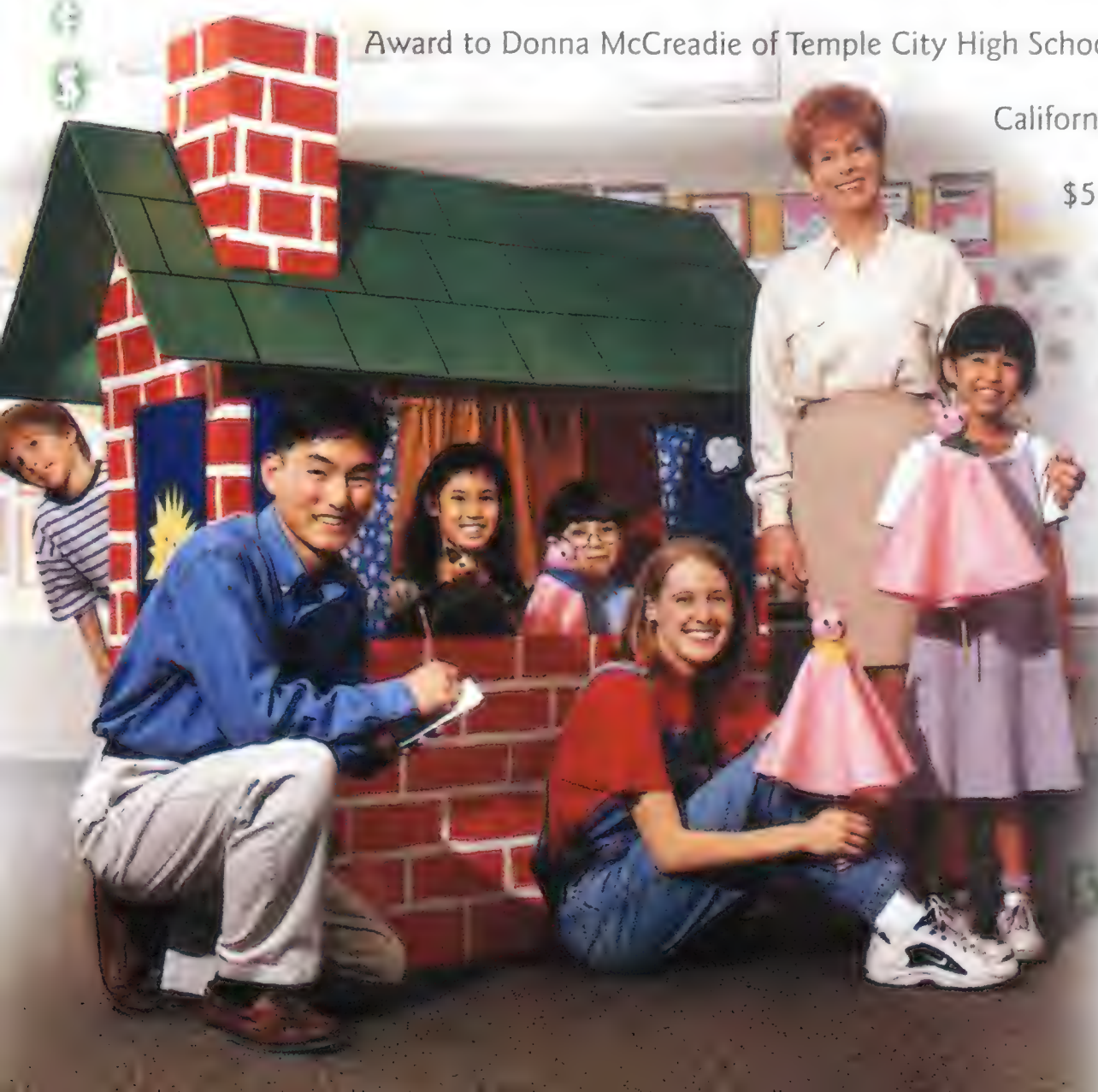
Letters for consideration in this column must include your full name, daytime telephone number and street address. Letters may be edited for clarity and length. Send mail to LettersEd@simag.si.edu or to Smithsonian Letters Editor, P.O. Box 44400, Washington, DC 20026-4400.

This little piggy went to the bank.

Once upon a time, there was a teacher named Donna McCreadie, who believed that all students from K to 12 should be exposed to the principles of economics. So Mrs. McCreadie had her high school students rewrite traditional fairy tales, turning them into children's plays which emphasized economic concepts like scarcity and choice. The high schoolers then worked with a class of 2nd graders, helping them to create stick puppets and perform the plays.

According to parents, the plays, with names like "The Three Economic Little Piggies" and "Goldilocks and the Three Entrepreneurs" were so well received, they "brought down the house." (This was even true of the plays that didn't involve a big bad wolf!)

For giving 12th graders a lesson in giving lessons, and for getting 2nd graders so excited they "chose economics over recess," State Farm is pleased to present the Good Neighbor Award to Donna McCreadie of Temple City High School in Temple City, California. We'll also donate $5,000 in her name to help the Close-Up Foundation live happily ever after.



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Reading for the Blind

VISUALLY IMPAIRED SUBSCRIBERS TO RECORDED PERIODICALS PERUSE EVERYTHING FROM *FORBES* TO *SKEPTICAL INQUIRER*

BY MICHAEL KERNAN

Volunteer Joseph Gebhardt reads SMITHSONIAN in a recording booth at Associated Services for the Blind in Philadelphia.

NO ONE IN THE WORLD KNOWS SMITHSONIAN MAGAzine better than Joseph J. Gebhardt. He reads practically every word of every issue, from the table of contents to the last gasp of the final essay. Aloud.

Gebhardt is a volunteer reader for Associated Services for the Blind (ASB), based in Philadelphia. It takes him from seven to ten hours to get through an issue, leaving out the ads and additional reading citations but including everything else, even the captions on the pictures, which he describes.

"I begin cold," he tells me. "It's more spontaneous if I don't rehearse."

This is not easy, as anyone who has listened to a TV newscaster lurching through the sentences on a TelePrompTer will tell you. "It's an eye-mouth connection, the eye goes ahead to see where the sentence is going. I make a few spoonerisms, but sometimes I can read a whole page without a mistake."

He omits nothing, but he adds nothing, either, unless it is to explain some technical point in a "reader's note." A dictionary lies on his desk to help with pronunciation.

"We have sources for foreign words, at colleges and so on," he says, "but even those sources don't always know. One article had a bunch of Gaelic words, all those consonants, and the sources couldn't help me, so finally I found an Irish newspaper and I got the editor and had this really delightful conversation with her. Nowadays we're more apt to get into Chinese or Thai, though."

He likes remaining a more or less anonymous conduit. It's not his show, he says. Once in a while he will laugh out loud, though. There was a piece on the Old West where a cowboy goes into a saloon and orders beer and cheese. He tells the bartender the cheese is no good, he can't smell a thing. The bartender says, "Well, take yer feet off the table and give the cheese a chance."

Gebhardt left that laugh in. More often than not he edits out his involuntary additions. "I try not to comment in any way," he tells me. He has been known to break into a New York Jewish accent, however, when appropriate for a humorous piece.

As a former research chemist who worked for years for General Electric, he loves anything scientific, and he's at home describing diagrams of complex molecules, for instance, but he's not so happy with articles on modern art, "Kandinsky and all that stuff—how do you describe the illustrations?" he asks. Not all the listeners are totally blind, of course. Many are dyslexic or partly sighted. But they appreciate his work, one and all. Occasionally he will get a little help, like the letter from the man in Quincy, Massachusetts, who pointed out that the town is pronounced "Quinzy," a point of some importance to those who live there.

Gebhardt started reading for the blind around 1967. For years he had been playing guitar with a local band, the Moonlighters, and had bought a reel-to-reel recorder with the idea of immortalizing them. One night he heard an ad seeking readers for the blind and decided he'd had enough of being drowned out by Glenn Miller-type trombones. For a while he read *Science* magazine, but later he concentrated on SMITHSONIAN, which he's been reading ever since.

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"We send out about 25,000 copies a year to individuals and libraries, but we're serving more."

I thought he must have built up an incredible store of miscellaneous knowledge over the years, but he insists that "most of it goes in one ear and out the mouth."

Gebhardt, a native of Queens, got his B.S. degree from Hobart College during World War II while serving in the Naval Reserve. Soon he shipped out to the Pacific, to places like Iwo Jima and Okinawa. Later he did graduate studies at Carnegie Tech. His work has taken him all over the country, notably to Nevada, where he worked with a chemical company on a high-energy fuel project. His specialty at GE was carbon and graphite, which means he has always been more or less at the frontiers of science, in this age of heat-proof nose tips and shields. He is 75, or so he claims. It was hard for me to believe.

Half a day a week Gebhardt spends repairing the playback equipment that is issued free to the blind listeners. This is a vital part of the job, for blind people are apt to drop things into their machines. Also, these machines get a lot of use and tend to wear out.

Readers like Joe Gebhardt are not easy to find. For one thing, he speaks rather slowly, and with great clarity. I was reminded of some movies I've seen lately, where I could barely decipher the slurred talk of the young stars but could get every word when a classically trained Briton like Pete Postlethwaite came on the screen.

John Corrigan, the manager of the recorded periodicals department of ASB, auditions volunteers, giving them word lists to test their pronunciation and trying their skill with articles that feature several voices. "Some people," Corrigan says, "can read the phone book and you're hooked."

Taking me on a quick tour of his crowded domain, Corrigan showed me the sound booths where many of his 100-plus readers record magazines and books on tape. Some, like Gebhardt, typically work at home and send in the reels. Postage is free, by the way, for all materials used by the blind. It's one of the great unsung services of the federal government.

"We get the reel, and then we transfer it to specially formatted cassettes," explains Corrigan. "Your regular cassette runs 90 minutes and has two tracks for stereo. We record at half speed and use each track separately, which gives us six hours per cassette. We send out about 25,000 copies a year to individuals and libraries, but we're probably serving quite a bit more."

In case you wondered, the reader inserts a beep at the beginning of the tape and after each article or section read. So a listener who wants to hear, say, the third item on the first side of the tape simply fast-forwards to the third beep. A subscription fee is charged to offset the cost of the tapes.

Since the 1960s, ASB has been recording with the good old Sony 105 reel-to-reel machines, which are no longer being made. The cassette copies are then produced from the open reel masters. One of these days, if the technology produces the right digital recorder and ASB comes up with the necessary funds, it might get new recorders.

Currently ASB is providing audio versions of 26 magazines, from *Popular Mechanics* to *Skeptical Inquirer* to *Forbes*. The majority are science magazines, serving the area's scientifically oriented population.

When Gebhardt began recording periodicals in the 1960s, it was for an organization called Science for the Blind, founded by a Haverford College physics professor named Tom Benham. "People were reading articles for me and I thought other blind people would like to hear things read too," says Benham, who enlisted volunteer readers from around the country. Unable to purchase the expensive duplicating machines he needed, the determined Benham got some students to help him build the necessary equipment.

In the 1970s, when he began creating products to help blind people in career and recreational pursuits, Benham donated the reading service, including the equipment, to one of ASB's parent companies, Volunteer Services for the Blind. In 1984, Volunteer Services merged with the Radio Information Center and the Nevil Institute to become the largest private nonprofit organization helping the blind in the Delaware Valley. Though much of its work is done in this area, its outreach extends across the nation and to other parts of the world.

There is the radio information center's 24-hour broadcasts of newspapers and other material—including the grocery ads—transmitted through special receivers. There is the Latino Support Group, teaching English, and Gateway Technology, teaching computer skills to the blind. There is a Braille printing department, rehabilitation and training services for the newly blind, even an urban gardening group. Some 260 volunteers run these projects. There is also the Philadelphia Lighthouse of the Blind, which gives small grants to local residents for specific needs.

"It's about independence and opportunity," says John Corrigan, who has been with ASB for 15 years and, like many of the other employees, has undergone blind sensitivity training, which means wearing an eye bandage for a while to get some idea of what blind people experience. "If we can teach them mobility skills and computer skills and provide them with Braille and recorded materials, they can resume their independent lifestyle."

Gebhardt agrees. And he gets a kick out of reading SMITHSONIAN. He has come to feel he knows some of the regular contributors personally, if not to actually shake their hands as he shook mine. I must say, I thought I was in a bit of a time warp when I heard my column being read aloud, as this one will be. Hi, Joe!

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PHENOMENA

COMMENT & NOTES

Expressions: The Visible Link

DARWIN BELIEVED EXPRESSIONS OF EMOTION REVEAL THE UNITY OF HUMANS AND THEIR CONTINUITY WITH ANIMALS

BY JOHN P. WILEY, JR.

HE WAS AN ENGLISHMAN WHO went on a five-year voyage when he was young and then retired to a house in the country, not far from London. He wrote an account of his voyage, and then he wrote a book setting down his theory of evolution, based on a process he called natural selection, a theory that provided the foundation for modern biology. He was often ill and never left England again.

There's a lot more to Charles Darwin, however, than *On the Origin of Species*, the book that changed the world. For years I had the vague impression that Darwin must have written hundreds of books. He had published four volumes just on barnacles, I knew, but often it seemed that whenever I became interested in something, it would turn out that Mr. Darwin had written a book about it. It happened with worms (talk about "ecosystem services"); it happened with climbing vines moving through forests like green snakes; it happened with the extraordinary variety of flowers on a single plant species, including the purple loosestrife running amok in North America these days. And now it has happened on a question of interest to anyone who has ever lived with a dog or a cat: What do these creatures feel?

This year a new edition of *The Expression of the Emotions in Man and Animals* has appeared. In it Darwin wondered whether human facial expressions are innate, the same in cultures around the world. And in support of his underlying theory that humans are an extension of the animal continuum, he set out to show that animals have many of the same ways of physically expressing emotions as humans. The book was published in 1872. The current edition is the first to include all the changes Darwin wished to make.

Darwin's expression is enigmatic in this portrait from 1881, the year before he died.

Darwin didn't write hundreds of books, of course, but he covered extraordinary amounts of ground in those he did write. According to the editor of the new edition, Darwin wrote *Expression* to refute the contention that humans were created separately and are not on a continuum with the animals. More specifically, Darwin was writing against a book by a Sir Charles Bell who, for example, considered the muscle in the human face that "knits the eyebrows" to be uniquely human. In the margin of Bell's book, Darwin wrote: "monkey here? . . . I have seen well developed in monkeys . . . I suspect he never dissected monkey."

Darwin's primary goal was to show that all humans have certain innate qualities, including facial expressions. This, in turn, would be evidence of a common progenitor. His evidence was the sort that today would be dismissed as anecdotal. Yet Darwin compiled so much of it from so many correspondents in so many different places that its sheer volume and variety became authoritative. In Australia, for example, as related in a biography by Adrian Desmond and James Moore, "missionaries and magistrates from Queensland to Victoria ceased converting and incarcerating to observe aboriginal ways. . . ."

As Paul Ekman, the editor of this new edition, puts it, "He gathered information from others about people in different cultures, infants, children, the insane, the blind, and a variety of animals. No one writing about emotional expression today has used such diverse sources."

Darwin himself, of course, was a keen observer, whether of his own children, his dogs and cats, or even a stranger encountered on a train: "An old lady with a comfortable but absorbed expression sat nearby opposite me in a railway carriage. Whilst I was looking at her, I saw that the [muscles at the corner of the mouth] became very slightly, yet decidedly, contracted; but as her countenance remained as placid as ever, I reflected

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how meaningless was this contraction. . . . The thought had hardly occurred to me when I saw that her eyes suddenly became suffused with tears almost to overflowing, and her whole countenance fell."

The study of expression goes on today. Ekman, a professor of psychology at the University of California at San Francisco, has studied the expression of emotions for more than 30 years. His early work took him to a tribe in Papua New Guinea whose members had had almost no contact with the outside world. His translator would describe different situations and show them photographs of people with various expressions, and ask them to match situation with photograph. Almost invariably, they chose the same pictures as did people from countries around the world.

Darwin asked not only what humans and animals did, but why. He wound up with three principles he felt answered the last question. The first he called the principle of serviceable associated habits. By this he meant that certain actions could be of service in certain states of mind, and the same movements would be performed out of habit even when they had no use whatsoever. He offered pages of examples. A person describing a horrible sight will often close his eyes and even shake his head, as if to drive the sight away. Or a person trying to remember something, on the other hand, often raises her eyebrows, as if to see better.

By "expression" Darwin meant any bodily movement or posture ("body language"), not just facial expressions. He wrote of horses scratching themselves by nibbling those parts they can reach, and how horses show each other the parts they want scratched so they can nibble each other. A friend told Darwin that when he rubbed his horse's neck, the horse stuck its head out, uncovered its teeth and moved its jaws, just as if it were nibbling another horse's neck.

A dog set to attack, top, has its ears and tail up; its hair is bristling. On seeing its master, above, all aspects are reversed.

Darwin called his second principle antithesis. He described a dog ready to attack that suddenly recognizes its master and changes almost every aspect of its appearance. None of the latter expressions are of any use to the dog; they are simply the antithesis of what had been before.

Darwin offered his own study of how quickly a dog's expression can change: "I formerly possessed a large dog, who, like every other dog, was much pleased to go out walking. He showed his pleasure by trotting gravely before me with high steps, head much raised, moderately erected ears, and tail carried aloft but not stiffly. Not far from my house a path branches off to the right, leading to the hot-house, which I used often to visit for a few moments, to look at my experimental plants. This was always a great disappointment to the dog, as he did not know whether I should continue my walk; and the instantaneous and complete change of expression which came over him, as soon as my body swerved in the least towards the path was laughable. His look of dejection was known to every member of the family, and was called his *hot-house face*. This consisted in the head drooping much, the whole body sinking a little and remaining motionless; the ears and tail falling suddenly down, but the tail was by no means wagged."

His third principle has to do with involuntary actions of our nervous systems. He listed trembling brought on by fear or even delight, mentioning a boy so excited by having shot his first snipe that he could not reload for some time. Ekman quotes a present-day psychophysiologist as saying Darwin's emphasis on heart-brain communication "is now the focus of contemporary research and theory on both emotion and health."

So why was this book rejected or ignored for a hundred years? Ekman offers five reasons. First, Darwin was convinced that animals had emotions and expressed them. This theory was dismissed as anthropomorphism. Second, as mentioned above, his data was anecdotal. A third reason is that Darwin, a man of his times, believed that acquired characteristics could be inherited, an idea long since discredited. The fourth is that Darwin studiously avoided the communicative value of expressions. One possible explanation is that he was steering clear of the idea, common in his day, that God had given humans special physical capabilities to form expressions. The last brings us right up to the current controversy over such ideas as sociobiology. In Darwin's day behaviorism ruled. People believed that we are completely products of our environment, and therefore that "equal opportunity would create men and women who were the same in all respects." Most scientists today agree that we are creatures of nature as well as nurture. Genetics, not culture, makes certain expressions universal.

This is a book you'd want to have in your cottage the year it rained every day. It also is a book that leaves you staring into space, wondering what might have been if this sickly recluse had felt a little stronger during the last 40 years of his life.

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SMITHSONIAN HIGHLIGHTS

EVERY FIVE YEARS, THOUSANDS OF SINGers and dancers converge on Riga for the Latvian Song Festival. Participants, many decked out in traditional dress and wreaths of fresh flowers (top), regale an audience of tens of thousands with a lively variety of folk song and dance. In Suring, Wisconsin, Betty Piso Christenson honors her family's Ukrainian heritage by creating traditional, elaborately decorated eggs each Easter (bottom left). On the island of Mindanao in the Philippines, back strap looms (bottom right) are used to weave brightly patterned textiles. All this and more is coming soon to the National Mall as part of the 32nd annual Smithsonian Folklife Festival. From June 24 to 28 and July 1 to 5, visitors will be able to learn about the Baltic nations of Estonia, Latvia and Lithuania, explore Philippine culture, celebrate 150 years of Wisconsin statehood and take a look at the Rio Grande/Río Bravo Basin in an engaging series of performances, workshops, exhibitions and demonstrations. Festival hours are from 11 A.M. to 5:30 P.M. daily, with dance parties featuring traditional music each evening from 5:30 to 7. Special concerts will be held every night from 7 to 9, except July 4. Come join in the fun. —*Diane M. Bolz*

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Transderm Scōp®
scopolamine 1.5 mg

Transdermal Therapeutic System

Programmed to deliver *in vivo* approximately 1.0 mg of scopolamine over 3 days

Brief Summary
(For full prescribing information, see package insert)

INDICATIONS AND USAGE: Transderm Scōp is indicated for prevention of nausea and vomiting associated with motion sickness in adults. The patch should be applied only to skin in the postauricular area.

CONTRAINDICATIONS: Transderm Scōp is specifically contraindicated in persons who are hypersensitive to the drug scopolamine or to other belladonna alkaloids, or to any ingredient or component in the formulation or delivery system, or in patients with angle-closure (narrow angle) glaucoma.

WARNINGS: Transderm Scōp should not be used in children and should be used with special caution in the elderly. See PRECAUTIONS.

Since drowsiness, disorientation, and confusion may occur with the use of scopolamine, patients should be warned of the possibility and cautioned against engaging in activities that require mental alertness, such as driving a motor vehicle or operating dangerous machinery.

Potentially alarming idiosyncratic reactions may occur with ordinary therapeutic doses of scopolamine.

PRECAUTIONS

General: Scopolamine should be used with caution in patients with pyloric obstruction, or urinary bladder neck obstruction. Caution should be exercised when administering an antiemetic or antimuscarinic drug to patients suspected of having intestinal obstruction.

Transderm Scōp should be used with special caution in the elderly or in individuals with impaired metabolic, liver, or kidney functions, because of the increased likelihood of CNS effects.

Caution should be exercised in patients with a history of seizure or psychosis, since scopolamine can potentially aggravate both disorders.

Information for Patients: Since scopolamine can cause temporary dilation of the pupils and blurred vision if it comes in contact with the eyes, patients should be strongly advised to wash their hands thoroughly with soap and water immediately after handling the patch. In addition, it is important that used patches be disposed of properly to avoid contact with children or pets.

Patients should be advised to remove the patch immediately and contact a physician in the unlikely event that they experience symptoms of acute narrow-angle glaucoma (pain in and reddening of the eyes accompanied by dilated pupils). Patients should also be instructed to remove the patch if they develop any difficulties in urinating.

Patients should be warned against driving a motor vehicle or operating dangerous machinery while wearing the patch. Patients who engage in these activities should also be aware of the possibility of withdrawal symptoms when the patch is removed. Patients who expect to participate in underwater sports should be cautioned regarding the potentially disorienting effects of scopolamine. A patient brochure is available.

Drug Interactions: Scopolamine should be used with care in patients taking drugs, including alcohol, capable of causing CNS effects. Special attention should be given to drugs having anticholinergic properties, e.g., belladonna alkaloids, antihistamines (including meclizine), and antidepressants.

Carcinogenesis, Mutagenesis, Impairment of Fertility: No long-term studies in animals have been performed to evaluate carcinogenic potential. Fertility studies were performed in female rats and revealed no evidence of impaired fertility or harm to the fetus due to scopolamine hydrobromide administered by daily subcutaneous injection. In the highest-dose group (plasma level approximately 500 times the level achieved in humans using a transdermal system), reduced maternal body weights were observed.

Pregnancy Category C: Teratogenic studies were performed in pregnant rats and rabbits with scopolamine hydrobromide administered by daily intravenous injection. No adverse effects were recorded in the rats. In the rabbits, the highest dose (plasma level approximately 100 times the level achieved in humans using a transdermal system) of drug administered had a marginal embryotoxic effect. Transderm Scōp should be used during pregnancy only if the anticipated benefit justifies the potential risk to the fetus.

Nursing Mothers: It is not known whether scopolamine is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when Transderm Scōp is administered to a nursing woman.

Pediatric Use: Children are particularly susceptible to the side effects of belladonna alkaloids. Transderm Scōp should not be used in children because it is not known whether this system will release an amount of scopolamine that could produce serious adverse effects in children.

ADVERSE REACTIONS: The most frequent adverse reaction to Transderm Scōp is dryness of the mouth. This occurs in about two thirds of the people. A less frequent adverse reaction is drowsiness, which occurs in less than one sixth of the people. Transient impairment of eye accommodation, including blurred vision and dilation of the pupils, is also observed.

The following adverse reactions have also been reported on infrequent occasions during the use of Transderm Scōp: disorientation, memory disturbances, dizziness; restlessness; hallucinations; confusion; difficulty urinating; rashes and erythema; acute narrow-angle glaucoma; and dry, itchy, or red eyes.

Drug Withdrawal: Symptoms including dizziness, nausea, vomiting, headache, and disturbances of equilibrium have been reported in a few patients following discontinuation of the use of the Transderm Scōp system. These symptoms have occurred most often in patients who have used the system for more than three days.

OVERDOSAGE: Overdosage with scopolamine may cause disorientation, memory disturbances, dizziness, restlessness, hallucinations, confusion, psychosis, convulsions, bronchospasm and respiratory depression, and muscular weakness. Should these symptoms occur, the Transderm Scōp patch should be removed immediately, adequate hydration should be maintained, and appropriate symptomatic treatment initiated.

CAUTION: Federal law prohibits dispensing without prescription.

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SMITHSONIAN

HIGHLIGHTS

Art Night on the Mall

Enjoy special extended summer hours at the Hirshhorn Museum & Sculpture Garden, the Museum of African Art, and the Freer and Sackler galleries, Thursday evenings until 8 P.M. through September 3. The Ripley Center's International Gallery and the Hirshhorn's Full Circle Café will also remain open.

Special June Exhibitions, Events

FREER GALLERY OF ART

Japanese Art in the Age of Koetsu (June 6-January 3, 1999) Exhibition highlights the cultural renaissance of early 17th-century Kyoto—paintings, calligraphy, ceramics.

Charles Lang Freer and Egypt (opens June 13) Display features works from Freer's collection of ancient Egyptian artifacts.

ARTHUR M. SACKLER GALLERY

Sakhi: Friend and Messenger in Rajput Love Paintings (through July 7) Paintings illuminate the role of the "sakhi" in Indian Rajput love paintings.

NATIONAL MUSEUM OF AFRICAN ART

Olowe of Ise: A Yoruba Sculptor to Kings (through September 7) African art masterpieces by the early 20th-century Yoruba carver.

HIRSHHORN MUSEUM & SCULPTURE GARDEN

Triumph of the Spirit: Carlos Alfonzo, A Survey (1975-1991) (June 18-September 13) Retrospective of the work of the Cuban-American artist traces his varied and complex painting style.

The Collection in Context: Henry Moore's Stringed Figure No. 1 (June 4-October 25) One-gallery installation features the British artist's 1937 sculpture.

INTERNATIONAL GALLERY, S. DILLON RIPLEY CENTER

The Jewels of Lalique (through August 16) Considered the greatest artist-jeweler since the Renaissance, René Lalique (1860-1945) designed the first "modern" jewelry. See page 70.

Planning a Smithsonian Visit?

Receive a free Associates' planning packet. Write Smithsonian Information, Smithsonian Institution, Washington, D.C. 20560, or call 202-357-2700 (voice) or 202-357-1729 (TTY), 9 A.M. - 5 P.M., Monday-Friday; 10 A.M.- 4 P.M., Saturday-Sunday. Note: Parking near the Smithsonian is limited. The Metrorail subway is convenient to all museums (details in packet).

Begin your visit at the Smithsonian Information Center's Associates' Reception Desk—open 9 A.M. - 4 P.M. daily—in the Castle. Special materials await you there. The Court dining room and all other eating facilities in the National Museum of Natural History are closed. Associates may receive a discount at the National Air and Space Museum's Wright Place restaurant, open 11:30 A.M. - 3 P.M. daily.

Smithsonian museums are generally open 10 A.M.- 5:30 P.M. daily, except December 25. Hours at the National Zoo are 10 A.M.- 6 P.M. daily for buildings, and 6 A.M.- 8 P.M. for grounds.

SMITHSONIAN WEBSITE

The Smithsonian home page on the World Wide Web (www.si.edu) offers on-line information about exhibitions, collections, events and products.

NATIONAL AIR AND SPACE MUSEUM

Business Wings (opens June 12) Exhibition examines the history of business aviation, from biplanes to Lear jets.
Star Wars: The Magic of Myth (through November 1) Original props, models, costumes and artworks from the *Star Wars* trilogy. Free timed same-day passes are available at the museum's ticket desk, on a first-come basis. Advance passes are available through ProTix for a service charge of $2.25 per ticket (1-800-529-2440). For information, call 202-786-2122.

NATIONAL MUSEUM OF NATURAL HISTORY

Janet Annenberg Hooker Hall of Geology, Gems and Minerals New permanent gallery showcases the National Gem Collection and takes visitors from the depths of a copper mine to the far reaches of the Solar System.

NATIONAL ZOOLOGICAL PARK

Amazonia Permanent installation re-creates a microcosm of the world's largest rain forest and river habitat.

NATIONAL MUSEUM OF AMERICAN HISTORY

First Ladies: Political Role and Public Image Permanent exhibition explores the evolving roles of our nation's First Ladies.

NATIONAL POSTAL MUSEUM [NEAR UNION STATION ON CAPITOL HILL]

What's in the Mail for You! Permanent hands-on display offers an innovative look at the direct mail industry.

ARTS AND INDUSTRIES BUILDING

Speak to My Heart: African American Communities of Faith and Contemporary Society (runs indefinitely) Exhibition presented by the Anacostia Museum and Center for African American History and Culture focuses on the role of the black church in contemporary life.

NATIONAL MUSEUM OF AMERICAN ART

Posters American Style (through August 9) Exhibition features American poster graphics from circa 1895 to 1995.

NATIONAL PORTRAIT GALLERY

Faces of Time: 75 Years of Portraits for Time Magazine (through August 2) Show presents cover portraits commissioned by *Time* magazine from notable artists.

COOPER-HEWITT, NATIONAL DESIGN MUSEUM [NEW YORK CITY]

Fountains: Splash and Spectacle (June 9-October 11) Display examines the function and design of fountains. See page 50.
Under the Sun: An Outdoor Exhibition of Light (June 21-October 25) The power of the sun as a catalyst for design.

BARBADOS

BEYOND YOUR IMAGINATION

WHAT GOOD ARE THEY? WELL, THEY MAKE PEOPLE SMILE AND DOGS BARK. ISN'T THAT GOOD ENOUGH?

Blimps

Big, Beautiful & Everywhere You Look

THE GOODYEAR PEOPLE TOLD ME THAT if I came to Akron, I might be able to hitch a ride in a blimp. The one they had in mind is named the *Spirit of Akron*. Although it is based in Ohio, it travels thousands of miles a year and is frequently seen on television, hovering over sports stadiums. It is more than 200 feet long, the largest airship flying in the United States today.

A few weeks later, I find myself standing in the blimp hangar with a bunch of the Goodyear guys, listening to them talk about airships. The hangar, at Wingfoot Lake, a few miles outside Akron, crouches like a huge Quonset hut on the rolling countryside. It has been the Goodyear Tire & Rubber Company's blimp base since 1917.

Spirit, as they call it, is stowed at one end of the building, but before I get to see the blimp, I meet G. P. "Pat" Henry, a former U.S. Navy pilot, Joe Hajcak, engineer and pilot, and Tom Riley, operations manager for all the Goodyear blimps. They are eager to tell me about their unique world. Did I realize that Goodyear has to decline a thousand requests annually for its blimps to appear at various events? Did I know that it takes a thousand cubic feet of helium to lift 60 pounds of blimp? Would I ever have guessed that the illuminated sign on *Spirit* weighs half a ton and has 8,200 bulbs? "But, hey, don't let us bury you with too much information," Tom Riley says finally. "We can't help it, you know. It's called 'airship bull.' You'll get used to it in a couple of days."

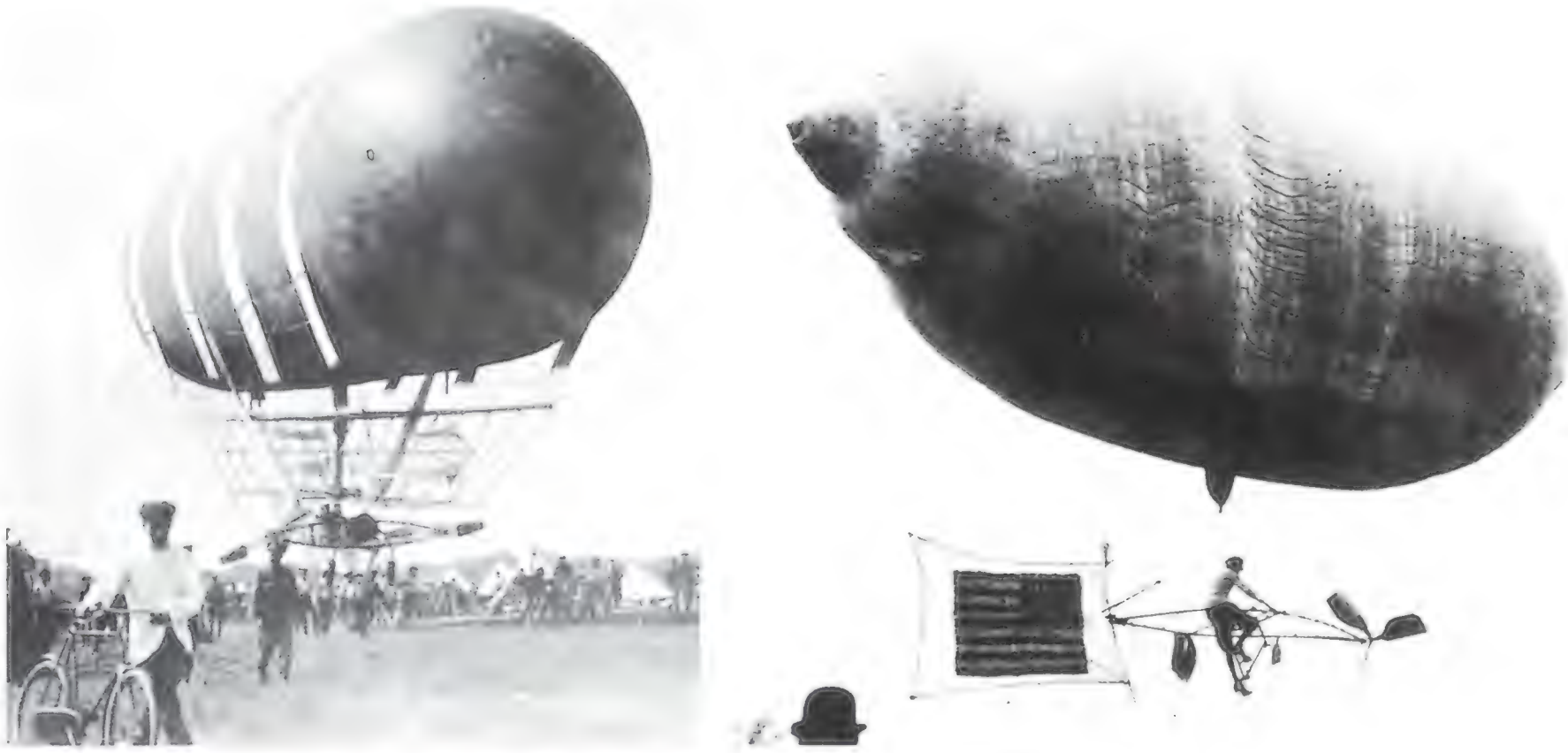
The hangar is a maintenance facility with many capabilities—welding, sewing, painting, rigging, glazing and so on. "We could build a whole, new blimp right here if we had to," a young rigger tells me with pride. I believe him. There are parts of cannibalized blimps all over the place, and there are people who remember where each part came from. The most notorious of these fragments is the gondola of a blimp that came down in California after an antisubmarine patrol during World War II—without any sign of its two-man crew. It is one of blimpdom's enduring mysteries. The *L-8* had once been a Goodyear blimp; it was sold to the U.S. Navy, then repurchased after the war. The fate of its officers remains unknown.

Eventually we take a walk to see the *Spirit of Akron*. A phrase out of history comes back to me at this moment. When the forty-niners headed west during the California gold rush, they shouted: "We're going to see the elephant!" They meant they were on their way to see something they believed would be new, strange and wonderful. I feel the same way.

When the last door is rolled open and I step

In its hangar, the *Spirit of Akron* makes everything else seem tiny. The four huge tail fins provide stability.

BY CHARLES N. BARNARD ▪ PHOTOGRAPHS BY CHAD SLATTERY



Britain's first military airship (left) created a stir when it flew over London in the fall of 1907. That same year, Cromwell Dixon demonstrated his pedal-powered blimp in St. Louis (right). He and others offered a spectacle-for-hire to county fairs and the like.

into *Spirit*'s space in the hangar, I see something resembling a silver-gray storm cloud that has been pulled down from the sky and tied to the floor. On TV screens, blimps look like they're only a few inches long, so an encounter with the real thing is a shock. I feel lilliputian as I walk around under the ship's six-story mass. It is humbling to be in the presence of something so much larger than life.

The Chinese claim they had a cigar-shaped envelope filled with hot air that flew in 1306.

Blimps are hot. They have marquee names, make appearances, draw crowds. People scramble to get close to them, to touch them, to scrawl graffiti on them with lipsticks and felt-tip pens. It's true not just of Goodyear blimps but of a crowd of others as well, floating over everything from the Kentucky Derby to a frog-jumping contest. Blimps are showing up as trendy props in TV advertising, too. An actor bungee-jumps from one and scoops up a dab of salsa; a quarterback phones two blimp pilots flying over the stadium, to see if he left his truck lights on; a sweepstakes team arrives at a winner's front door with the big check while a blimp hangs in the sky.

Goodyear started flying the first of its airships in 1911. Over the years, it has dominated the American blimp business, but in recent years a brash new bunch has showed up emblazoned with all kinds of trademarks. What's it all about? Promotion, of course. Nothing promotes a spectacle better than a spectacle.

"Blimps bestow a certain cachet on the events they cover and on the companies they represent," says Michael Bolton, a blimp marketing man. "They make everything seem more important and more exciting by their very presence." A Goodyear pilot adds, "You've heard the saying that blimps make people smile and dogs bark. It's true. We're ambassadors of goodwill."

The bottom-line reality behind the blimp boom is not just brand-name exposure on TV. Blimp people offer the networks aerial photography at no cost. TV directors need those sparkling "beauty shots" of sports stadiums sunbathed by day and illuminated at night, and they pay for them with dutiful on-air acknowledgments.

The value of those fleeting looks, calculated at TV's extraordinary advertising rates, is what keeps blimps in the air these days—even over domed stadiums. If Goodyear gets 45 to 90 seconds of national TV exposure during a World Series game or the Super Bowl, it's worth millions. These rewards are more than enough to justify the cost of maintaining three big blimps. In addition to the *Spirit of Akron*, Goodyear operates the *Stars & Stripes*, based in Florida, and the *Eagle*, based in California.

A notice posted in Tom Riley's office announces that Goodyear's blimps earned the equivalent of nearly $20 million in TV exposure in 1997. That's why three new leased blimps joined the Goodyear fleet this year. Two are flying in Europe, one in South America.

Visionaries have always seen a future for airships that goes far beyond advertising, however. In South Africa, the Hamilton Airship Company has formulated plans for a luxury dirigible of near-*Hindenburg* proportions. It would carry 30 passengers across the Atlantic from Johannesburg

German civilians boarding an early zeppelin for a sight-seeing flight (top left) did not enjoy the luxury offered transatlantic passengers on the *Graf Zeppelin* (bottom left). Enthusiasm for airships crashed with the *Hindenburg* (right), in 1937.

to New York in ten days at speeds of up to 100 miles per hour. In New York City, Donald Trump recently conceived a plan to ferry 160 high rollers a day to his casino in Atlantic City aboard a luxury airship. The exorbitant cost, not any lack of engineering feasibility, caused him to shelve the idea.

A company called Airship Management Services (AMS) is working with a company in Saudi Arabia to provide a blimp for surveillance during the hajj, the annual gathering of millions of Muslims in Mecca and Medina. AMS blimps have already helped with crowd management at the Los Angeles, Seoul and Atlanta Olympics—examples of what many believe will be a growing airship market: police work and border patrols.

A German company, CargoLifter AG, is planning to build a gigantic cargo-carrying airship capable of flying 80 mph. When fully inflated, it will be longer than the Washington Monument is tall. It's aimed at the 59-billion-a-year market for transporting freight to places where planes can't land and for carrying cargo—turbines and power-generating equipment, for example—that is too bulky and heavy (up to 150 tons) for airplanes.

In the beginning, when only birds could fly, men who dreamed of breaking their earthbound shackles could not have conceived of cargo blimps and airship ferries. The Chinese claim they had a cigar-shaped envelope filled with hot air that flew in 1306. In the late 18th century, the Montgolfier brothers turned the French court upside down with excitement when they demonstrated their first hot-air balloons. One of their craft lifted the first humans aloft, over Paris, in 1783. Soon, paying passengers were being taken for rides; one such adventurer was aboard for the first aerial crossing of the English Channel in 1785. The balloon went from Dover to Calais in two hours.

But those early aeronauts were at the mercy of the winds. Naturally they had some reservations about drifting uncontrollably across the sky, so they turned their attention to matters of steering and propulsion. Oars, propellers driven by pedal power, and flapping wings were all tried as means to direct the earliest airships. A three-horsepower

steam engine was used for the first powered, man-carrying dirigible, in 1852. Eventually internal combustion engines became the power source of choice.

"Blimps," by definition, are nonrigid. "Zeppelins" are considered rigid because they have an interior frame. The word "dirigible" is used to refer to either type of airship.

Goodyear pilot John Moran and passengers cruise aloft in the *Spirit of Akron* at a stately pace of about 35 miles per hour.

Until World War I came along, airships remained novelties. The British recognized that blimps were ideal for submarine reconnaissance because they could remain stationary and thereby enable observers on board to look deep into the water. The Germans, supplied by the airship company founded in 1898 by Count Ferdinand von Zeppelin, used dirigibles to attack Britain; it was history's first large-scale bombing of civilians from the air. More than a hundred "Zepps," some more than 700 feet long, were so deployed, sometimes flying higher than 25,000 feet, well above the range of the pursuit planes of the day. London was bombed 55 times between 1915 and 1918, and hundreds died. But some zeppelins were shot down, too, going to earth in fiery, hydrogen-fueled plunges.

Airships went on to see their brightest and darkest days in the 1920s and 1930s. The Zeppelin company returned to production in 1928 with the passenger ship *Graf Zeppelin*, and its success seemed to promise a golden age. But then three giant U.S. Navy dirigibles, including the *Akron* and the *Macon*, built by Goodyear, fell victim to storms and crashes that killed 59 people. Two more deaths occurred as the result of a handling mishap in 1932. The *Akron* was attempting to moor at a camp in California when three crewmen, clinging to their handling lines, were suddenly borne aloft. One held on and was saved; the others fell to their deaths. Next came the spectacular *Hindenburg* disaster in 1937, which, thanks to film coverage and a horrified eyewitness radio report, etched in the public mind an image of tragedy that ended the era of intercontinental airship flight.

In World War II, Goodyear built more than 300 antisubmarine blimps of various sizes for the Navy. Those craft operated from more than 50 bases, patrolled thousands of miles of coastline, flew 55,900 missions and never lost one of the 89,000 merchant and troop ships they escorted. Only one blimp was lost to enemy action. In 1943, off Florida, the *K-74* was shot down while making a bombing run on a surfaced German sub. Nine crewmen survived in the water until they were rescued by a destroyer. The tenth man, unable to keep pace with the others, was picked off by a shark.

The 30-year partnership between Goodyear and the Navy came to an end in the early 1960s when the latter's blimp fleet was decommissioned. Lighter-than-air advocates had lost a battle within a Navy that had come to be dominated by proponents of aircraft carriers. Blimp safety was still regarded skeptically, anyway; blimp supporters were referred to disparagingly as "Helium Heads."

These days blimps may be hot in terms of their visibility, but they are not as numerous as TV exposure makes them seem. Only about two dozen airships are currently flying in the entire world. Three are owned by Goodyear. Three more belong to a German company, WDL, and fly only in Europe. Another German airship, the *Zeppelin NT*, built by the successor to the original Zeppelin company in Friedrichshafen, home of the Zeppelin Museum, made its first flight last year. Back in the United States, AMS operates the Fuji blimp, which has been flying the colors of the Japanese film firm since 1984.

The other 16 blimps constitute the world's largest proprietary fleet of airships. All have been built since 1989 by the American Blimp Corporation (ABC) in Hillsboro, Oregon. They come in two basic sizes and are leased to clients by a subsidiary of ABC, the Lightship Group in Orlando, Florida. If you have the feeling that blimps are everywhere, these are the guys to blame. Even competitors acknowledge that Lightships, as these blimps are known, have revolutionized the business. Most are relatively small, 130 feet long, and inexpensive to rent, at about $175,000 a month. (If you want to buy one outright, it will cost you a little less than $2 million.) They are visually arresting, especially at night, when interior illumination of the translucent envelope (by means of two 1,000-watt mercury vapor bulbs) creates a startling, lantern-in-the-sky effect. Lightships have a long and ever-changing client list. American Express, Mazda, Brut and even Goodyear have leased them, and current clients with long-term contracts include Budweiser, Blockbuster Video and MetLife. The Lightship Group is now making plans to revive the blimp tourist market. It anticipates having 40 airships that will fly over such sites as the Taj Mahal, the Masai Mara Game Reserve in Kenya and perhaps eventually the Grand Canyon.

In its Oregon factory, ABC employs 45 people and has the capacity to build five new blimps a year. It concentrates on variations of its two basic models—the original small Lightship and a larger, 9-passenger version of which

Whose idea was this whole "less is more" business, anyway? Certainly not ours. That will be apparent the moment you slip into the supple leather-trimmed seats of the new Town Car. It's all there: Spacious comfort. Distinctive design. Quiet elegance. And Town Car's legendary smooth ride. Because having it all is what this car is all about. For a free brochure, call 1 800 446-8888 or visit us at www.lincolnvehicles.com.

LINCOLN The new Town Car from Lincoln. What a luxury car should be.

two are now flying (one for Sanyo, one for Budweiser). A 40-passenger model, called the *Millennium*, may be ready to fly around the world in the year 2000. This is a feat that was first accomplished by the *Graf Zeppelin* seven decades ago.

Everyone these days seems to want a ride in a blimp. Operators are inundated with requests by phone, fax and e-mail. Alas, the ships are so few in number, so tightly scheduled and so limited in payload that only a tiny fraction of the requests can be granted. Happily, mine is among them.

Two loud horn blasts within the Wingfoot hangar summon the ground crew. The *Spirit of Akron* is about to be moved out to fly—with me aboard. As the airship, attached to a rolling pyramid mast, is pulled from the hangar, it slips slowly past me, momentarily blotting out the sun. Its two engines make a soft turbine whine. After *Spirit* is freed from the mast, eight crewmen hold the ship down by two nose lines while others grip a handrail around the gondola. There is a wind off the nearby lake; the men are tugging, leaning against the pull of the ropes. I move under the blimp, to the cabin door.

There's a hand on my shoulder and a voice in my ear. "Get aboard . . . in the copilot seat." I climb in. The door clicks shut behind me. I turn forward and slip into the big right-side chair. A bewildering array of radios and instruments blink a hundred tiny lights. Pat Henry, who has been flying blimps for 38 years, nods hello over the engine noise and points to a headset to put on. A curved windshield and dual controls are in front of me. On the ground, *Spirit*'s crew chief is holding a wind sock and giving Pat a thumbs-up: Go! The nose lines are cast off, ground crewmen dash away, Pat throttles on power.

We move forward for a few seconds, gathering speed, then rotate to what seems an extraordinary angle of climb. The nose lines, cast free, drift in the wind, two parallel white ropes pointing to earth like a dangling trapeze. We reach 1,000 feet in less than a minute and level off. Engine noise tunes down. The world and the horizon return in

Blimps and crew are most vulnerable during landing. All blimpers know the story of Navy linesmen who, in 1932, were pulled aloft, then fell to their deaths.

Before Unleaded. Be There.

Straight from the showroom. Stock. And it'll still blow the doors off anything on the road. Riverside red. With a 327 under the hood and fuel injection. (O.K., so it's not your everyday stock.) And with that fiberglass body, you swear you're going to become the first man to reach the moon. You're driving a 1963 Chevrolet Corvette Stingray.

Test drive the century's hottest vehicles, from the birth of the Harley Davidson to the street rod, on Dream Machines. Be there to burn rubber for the first time.

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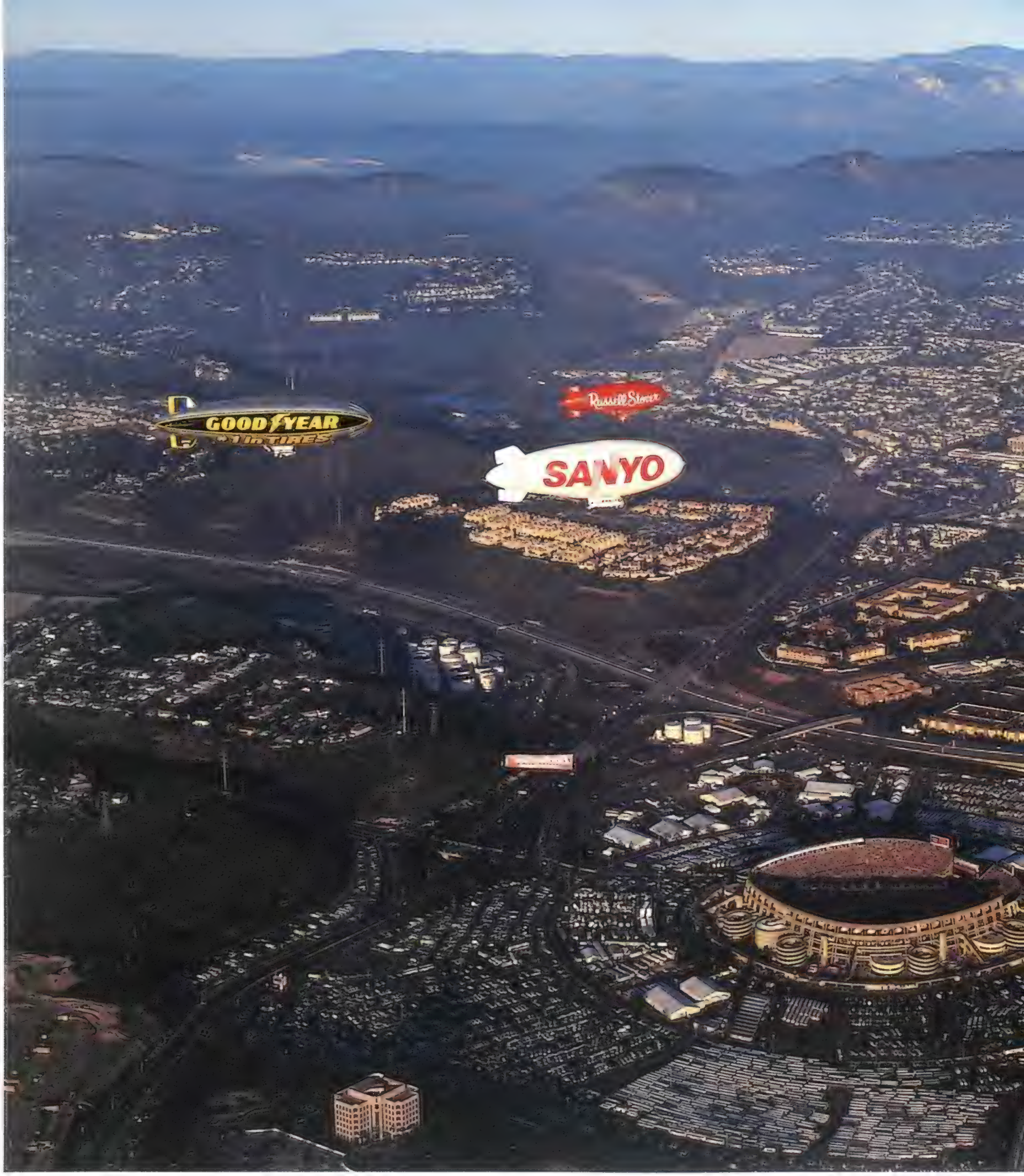
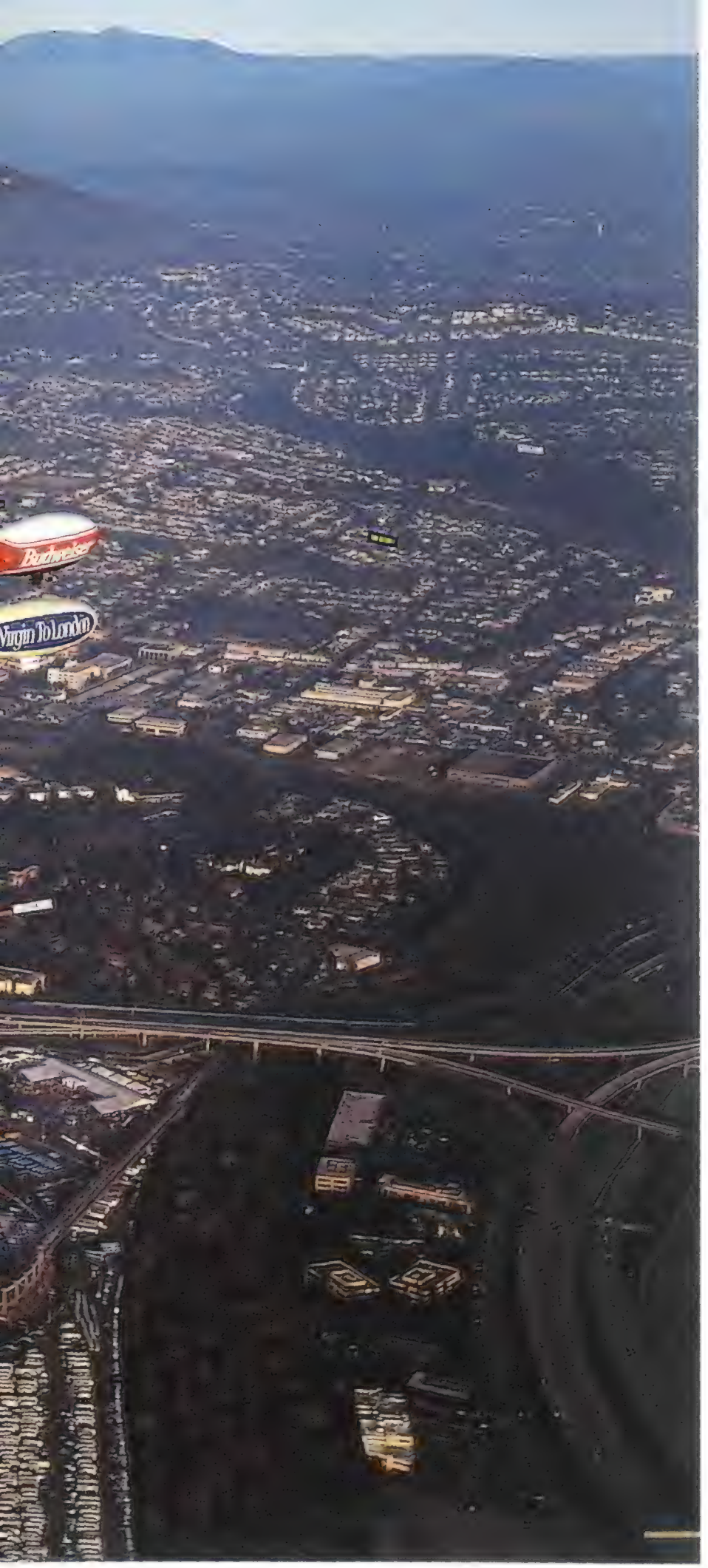


Signs of the times, no less than five blimps flaunt their sponsors' names over Qualcomm Stadium during the 1998 Super Bowl in San Diego. Basically, today's blimps are flying billboards vying for valuable seconds of airtime on TV.

the windshield: lake on the right, farmland beyond, the tall buildings of Akron on the horizon.

As we fly, making small talk on the headphones, *Spirit* pitches mildly, nose up, nose down, all its movements gentle and slow. The ground slips by at about 35 miles per hour.

We're just taking a little spin, but when *Spirit* goes on the road it is accompanied by a 40-foot tractor trailer, a bus and a van. A Goodyear team typically consists of 20 people: 15 ground crew (a blimp, unlike an airplane, is unable to take off or land without its ground crew), four



pilots and one public-relations person. All but the two working pilots travel in the support vehicles.

Pat's voice grumbles into my earphones. "Take it," he says, flipping a toggle switch at the top of his control column, and now I am flying the Goodyear blimp!

I have been watching Pat work big forward-and-back movements on the control column—forward to lower the nose, back to lift it. It looks easy—but it isn't.

Oops, there she goes on me, nose climbing, bring 'er down, bring 'er down! I push forward on the control column but she's still climbing, going way too far. I've lost the horizon, just blue sky in the windshield. Pat must think I'm a fool, but I don't have time to look at him. Now she's going down.

It isn't just the up-and-down motion that has to be controlled; there is also some roll. "See that short rope that hangs down between the nose lines?" Pat says, pointing 50 feet ahead. "Try and keep it between the other two."

Part of my brain tries to picture what is happening: a ten-ton rubber bag, more than 200 feet long, filled with a quarter-million cubic feet of gas, is moving through the sky like a loose balloon, no wings, no big power, no speed, a "sail area" of more than half an acre to catch every gust that comes along. I thought I would be able to feel all of this through my hands on the controls, the way I can when I fly a small plane. No such luck.

When Pat takes over again he gives me a wide, sidelong smile that seems to say: See what I mean about a blimp? It's unlike any other kind of flying.

We're heading back to the barn as quickly as possible. A windstorm is predicted from the west; the first gusts are already arriving. Below are the giant hangar, the pyramid mast and several acres of grassy field. The ground crew is arrayed to receive us, 15 people looking very small, the chief holding up his fluttering wind sock. Landing a blimp is tricky even without a wind. Pat is pushing *Spirit*'s nose down to earth with engine power now. The two long mooring lines sweep around in wild arcs as eight men try to grab them, rushing back and forth like soccer players, their arms all reaching up. Then . . . whoa there! . . . nothing!

A wind gust off the lake has caught us, and the blimp is being pushed sideways. The ropes are sailing away and the ground crew is running after them, hands raised, fingers grasping. Cardinal rule for the men who grab the lines to bring a blimp back to earth: if something goes wrong, let go! Never allow the ship to pick you up. Another go-around and this time we land as softly as an elevator reaching the ground floor. I hear thumps as crewmen toss ballast bags aboard to help keep us down. The gondola door clicks open. My ride on the *Spirit* is over.

I have been to see the elephant.

Charles Barnard was a mere lad aboard an ocean liner in 1928 when he looked up and saw the Graf Zeppelin on its maiden transatlantic voyage. Chad Slattery's photographs of the Getty Museum appeared in the December 1997 issue of SMITHSONIAN.

BY RICHARD WOLKOMIR

PHOTOGRAPHS BY CAMERON DAVIDSON

RACING TO REVIVE OUR EMBATTLED ELMS

WHAT CAN YOU SAY ABOUT A TREE THAT DIED? "I'VE BEEN watching that one for 12 years," Denny Townsend says, stopping his tan Oldsmobile along Glenn Dale Road, in Maryland, to admire an American elm. It has a peculiarity—unlike most of its kin, this elm is alive and well.

Townsend, a plant geneticist who has labored 20 years to resuscitate the American elm, was driving to his National Arboretum laboratory when he stopped to look at this specimen, one of his favorites. It is growing just two miles from the Washington, D.C. beltway, in the front yard of a brick house, but seems to stand in America's green heartland. Once the house was a doctor's home on the grounds of a tuberculosis sanatorium. Now the house is deserted, the sanatorium defunct. But the elm is thriving.

For three stories the trunk rises. Then it branches into the American elm's quintessential shape, a graceful green urn. It is brimming with health. And that is what makes this elm so astonishing—no other American elm remains alive for miles around. "Five years ago I began to propagate that tree," Townsend says, regarding it fondly. Does it have the magic genes he seeks?

Townsend clones elms at a National Arboretum facility here in Maryland, and at another government research station in Delaware, Ohio. He and his colleagues look for survivors, like this elm. Does their DNA code for resistance to the blight that has wiped out most of the species? Or were they just lucky?

Townsend is feeling sanguine. After 20 years of cloning elms and—in a good cause—injecting their saplings with the fungus that causes elm disease, he has hit the dendrologic jackpot. He and his colleagues have found not one but *two* American elm strains that resist the disease. Their saplings, now growing in nurseries, will be big enough in just a few years to plant along America's streets and in its yards. But maybe this elm, growing just down the road from his laboratory, will prove to have even better chromosomal stuff. Who knows?

"These trees could have been lost forever," Townsend says.

It would be like losing 5,000 years of human history. Palynologists, studying pollen in European peat layers, have discovered that elms suddenly declined 5,000 years ago. At first, researchers theorized that this was explained by an early assault of today's

Massive in its majesty, the National Champion American elm, the country's oldest and largest, soars to a height of 112 feet in Michigan.

elm plague, or a climate shift. But according to Hans Heybroek, of the Netherlands Institute for Forestry and Nature Research, the early elm decline has now been traced to a wave of cattle farmers coming into Europe. They penned their cows in their forest villages and fed them elm leaves and twigs, enough to decimate the elms.

Because cows were vital to prehistoric Europeans, so were elms. Heybroek cites Norse mythology, in which the gods create humans from two trees, an ash and an elm. Prehistoric farmers fattened their pigs on elm leaves, too, Heybroek notes. Early Europeans processed elm bark into ropes. Japan's native Ainu people fashioned clothes from elm bark. Norwegians regarded elm bark as emergency food for famines. Making skis out of so important a tree was taboo in Scandinavia.

Roman winemakers grew grapevines up into the crowns of living elms, a practice that was known as marrying the vine to the elm. Later in Europe, elm was considered second only to yew as a wood for bows. The false keel of a British man-of-war was usually elm, regarded as more shockproof than oak. France's Henry IV ordered elms planted because the wood was essential for wheels, gun carriages and carts. Napoleon ordered elms planted along his new roads to shade his marching soldiers. Even car bodies, as late as 1918, required the wood of elms.

Researcher Denny Townsend experimentally injects a tree with elm fungus. That pathogen is grown in his lab (top).

Elms have been integral to American society as well. It was under an elm in Cambridge, Massachusetts, that George Washington took command of the Continental Army. And William Penn, legend has it, stood under an elm to sign a treaty with his Native American neighbors. Elms once lined U.S. streets from the Atlantic to the Rockies. Even in Peyton Place, the imaginary New England village that gave its name to a racy 1956 best-seller, the main drag was Elm Street. Many an American town still boasts an Elm Street.

Mine did. Our village straggled downhill to the Hudson River, to a battered ferry dock. It was an old town, started by the Dutch in the 1600s, and the brick houses were

It was under an elm in Cambridge, Massachusetts, that George Washington took command of the Continental Army.

out-of-plumb, their white or yellow paint peeling. But it was a town beatified by its elms. Their trunks lined the streets like columns, rising above the roofs, then branching into graceful urns. The leaves were so high overhead, and so delicately green, they looked lacy. Often the elm crowns met across the street, forming a green tunnel.

It was a fine town tree. Better than maples or oaks or ashes or horse chestnuts, the American elm could tolerate salt and drought and temperature extremes and fumes. It could grow in thin urban soils, withstanding lawn mower damage and root compaction. It grew fast, too. And it rose so high before branching that it needed no pruning to keep its limbs from smacking windshields, or rubbing against shingles or even power lines. Besides, it was the Baltimore orioles' favorite. They suspended their hanging-basket nests from the upper branch tips, and so—high in the elms—there was a black-and-orange going and coming.

But the elms' popularity, with so many of the trees planted so close together, engendered their downfall. In 1930, a freighter brought elm logs from France to New York City. Then railroad cars carried the logs to furniture factories in Cleveland and Columbus, there to be sliced into veneers. A mildewlike fungus hid in the logs. So did European elm bark beetles. These insects breed in dead and dying elms, but they feed on the healthy trees. As the freight cars rolled toward Ohio, the hatchling European beetles, their legs and carapaces smeared with the fungus, abandoned the dead French logs for the bark of living American elms.

In 1919, Europeans had discovered elms wilting across Belgium, the Netherlands and northern France. Mystified observers called it Elm Death. But then a group of seven Dutch scientists (unusual for the time in that all were women) traced the blight to a fungus eventually named *Ophiostoma ulmi*. And so by 1926, when the disease reached England, it was known as Dutch elm disease. Scientists suspect the disease actually originated in Asia, because

Asian elms have evolved the most resistance, suggesting they have lived with the disease the longest. European elms were more susceptible. But the American elm proved the most vulnerable of all.

A death trail ran along the rail lines from the New York docks to the Midwestern furniture factories. And the plague spread fast. One year a tree would yellow and wilt. The next year it would be dead. By 1980 the fungus, at least according to some estimates, had killed 77 million American elms. Towns became naked.

My childhood village was one. Elms in such towns, planted side by side along the streets, did not have a chance. Fungus-infested beetles easily flitted from one tree to the next; the closely growing trees passed the fungus to each other through their intertwined roots. One day, in our town, all the elms were dead and sawed down. Then we saw our river hamlet as it really was: a minimum-wage factory town with cracked sidewalks and boarded-up stores, and a nighttime starkness under the streetlights.

So it went across the country. A turn-of-the-century postcard shows a flagstone walk on the Swarthmore College campus, in Pennsylvania, flanked by elms. By the mid-1980s, virtually all those Swarthmore elms were dead.

Elms died, too, in the towns where Alden Townsend was growing up, in Ohio, then New Jersey, and finally near Pittsburgh. The son of a chemical company manager, Alden, known to everyone as Denny, got interested in trees before he graduated from high school in 1960. Partly, it was through earning Boy Scout merit badges. Attending the huge 1957 Scout Jamboree in Valley Forge, Pennsylvania, was a highlight of his youth. But mostly his love of trees came from his uncle, a western Pennsylvania farmer and conservationist. Denny was a frequent visitor to his uncle Albert's farm, where he often helped with transplanting saplings in the spring.

He majored in forest sciences at Pennsylvania State University. At Mount Hood National Forest, in Oregon, he led a team scouting for sugar pines and white pines resistant to blister rust disease. But after earning his doctorate in plant genetics, he settled at the U.S. Department of Agriculture's Delaware, Ohio, research station. There he concentrated on developing better urban trees, including new elms that could resist Dutch elm disease. Eventually, he moved to the U.S. National Arboretum facility in Glenn Dale, Maryland.

He was en route to his Glenn Dale lab when he stopped to admire the amazingly healthy elm at the abandoned sanatorium. Now, back on the road, he explains to me what scientists currently know about the fungus.

When it invades a tree, he says, it travels up the xylem, which is a woody tissue vaguely analogous in function to our own arteries. Water and dissolved minerals percolate up the xylem: from the roots, up the trunk and out the branches. Some researchers suspect the invading fungus produces a toxin, cerato-ulmin, that causes at least some of the damage. But nobody is yet sure, Townsend says, because some trees injected with the toxin develop Dutch elm disease symptoms and others do not.

In a related experiment, he and his associates tried injecting the fungus itself into Siberian elms, which resist the ailment. They

Inside a Burlington, Kentucky, greenhouse, nurseryman Dick Ammon surveys two-year-old American elm saplings grown from disease-resistant stock. The saplings are the Valley Forge variety.

Across America, the elm blight has resulted in the kind of devastation evident in this Detroit neighborhood; elms thriving in 1974 (top) had been felled by 1981 (above).

found that the Siberian trees developed substantial foliar wilting and yellowing. "But the next year they came back as if they had never been sick," he says. That research, still unfinished, hints that the Siberian species may produce an antidote to the fungus's toxins.

"It's not yet known for sure what the fungus does, but we do know it creates tyloses, which are protrusions in the xylem that cut off the flow," Townsend says. It is, in a sense, botanical arteriosclerosis. "After the fungus gets into the tree, the leaves wilt, then yellow, then brown, then drop—the crown can die within a couple of months," says Townsend.

Fungicides injected into an afflicted tree can keep the disease at bay. Such regular doctoring has saved the elms bordering the Mall in Washington, D.C. But it is too costly and labor-intensive an undertaking for most towns or homeowners. And so Denny Townsend has been working on a different approach: for 20 years he has scouted out elms that have stayed healthy, like the sanatorium elm. Then he clones them and tests their saplings to see if the trees are truly resistant or just lucky.

Townsend conducts his work at this 70-acre National Arboretum facility, its tree-shaded lawns bearing resemblance to a posh country club's grounds. But close up, the place might be an obscure research station in Ukraine. Townsend's spartan stucco lab has the ambience of a small-engine repair shop, its drabness redeemed only by red celosia flowers blooming at the doorway. This Glenn Dale facility was created in the 1920s to test foreign plants for U.S. commercial or ornamental potential. As a result, it has become a tree zoo. And Denny Townsend's elms are prime exhibits.

In some plots, just spindly sprigs grow. In others, it is rows of gawky saplings. And some plots have junior trees. Before showing them off, Townsend stops at the lab, where horticulturist Susan Bentz removes a petri dish from a refrigerator. The dish contains a mildewlike white smear—*Ophiostoma ulmi*. Under a microscope, the fungus is a cottony mass of threadlike stems crowned by tiny balls. The organism seems too puny to kill an elm. "The fungus grows in beetle tunnels in the trees," Bentz explains.

Some foreign elm species are virtually impervious to the fungus. At one point, Townsend tried crossbreeding a resistant Asiatic species with the American elm. But results were disappointing. For one thing, American elms—despite their name, not the only elms growing in North America—have 56 chromosomes in their cells. All the rest of the world's perhaps 60 species, including the approximately 8 other North American species, like the slippery elm and the winged, cedar and rock elms, have 28 chromosomes. That makes it difficult to cross an American elm with any other species, whether from Asia, Europe or North America. Meanwhile, other kinds of elms are too short, lack the distinctive urnlike shape, are too brittle, or do not grow in a northern climate.

"The closest is an elm from China, which we call the Prospector, that does resist Dutch elm disease but doesn't grow to much more than 50 feet," says Townsend. "Nothing matches the grandeur of the American elm."

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Some 600 elms line the National Mall in Washington, D.C. The trees are monitored assiduously for disease.

He soon focused his research on the American elm itself. The idea was to emulate Thomas Edison's search for a workable lightbulb filament. Edison tried a dizzying array of possible filaments until he finally hit upon one that did the job. For Denny Townsend and his colleagues, the task was similar: to grow thousands upon thousands of elm trees, infect them with the disease and see which—if any—had a natural tolerance for the fungus.

U.S. Department of Agriculture scientists began screening American elms for tolerance to Dutch elm disease in 1937. By the time Townsend joined the search, in the early 1970s, the department had grown many thousands of specimens from seed. Meanwhile, people hearing about the project would sometimes report a thriving elm in their yard or along their street, positive it must be the magic elm. They all turned out to be just lucky elms. Ever hopeful, Denny Townsend, too, was always on the watch for a thriving elm. You never knew.

Such research is laborious. In the spring, from each prospective disease-resistant elm, a researcher snips a newly grown sprig, six to eight inches long. Pruning shears are used to scrape the cutting near its base, a step known as wounding the cutting. Then the "wounded" base is dipped in growth regulator, which mimics hormones and will spur the cutting to sprout roots. Next, the base end is inserted into a soilless propagation medium, such as peat moss, perlite (a volcanic glass) or bark.

For three to six weeks the cuttings live in a greenhouse, bathed in mist, until roots grow. Then they are slowly weaned from the mist, a process called hardening off. After that, depending on the season, the sprigs are either left dormant for the winter or potted. Eventually the growing sprigs are transplanted into the outdoor research plots.

It is then that Denny Townsend plays mad scientist. To save elms, he tries to make them sick. He demonstrates the process. First, he drills a small hole near the base of a sapling's trunk. Into the hole he pokes a hypodermic needle and injects a fluid containing the Dutch elm disease fungus. That is all. Over the next few years, it is up to the tree to show what it can do. "We try to inoculate different trees grown from the same clone at different times of the year, to see if that might be a factor," Townsend says, wielding his hypodermic.

Over 20 years, he and his associates have released to nurseries a variety of crossbreeds of Asian and European species that resist Dutch elm disease and look at least vaguely like the American elm. Walking through his Glenn Dale plots, under a hot Maryland sun, Townsend points to one such specimen in the elm zoo. "That one's from our European and Asiatic crossbreeding program,"

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Townsend estimates that only 1 in 100,000 American elm trees can resist Dutch elm disease.

he says. To create this tree, researchers collected pollen from a disease-resistant Chinese lacebark elm, which flowers in the fall, and stored the pollen in a freezer over the winter. They then introduced the pollen into the blossoms of a spring-flowering European elm also resistant to Dutch elm disease. "We call it Frontier," says Townsend. "It turns a spectacular red in the fall."

But it is a disease-resistant *American* elm that Denny Townsend has sought for 20 years. And now he stops at one test plot, where rows of gangly saplings look like awkward teenagers hanging out. "There they are," Townsend says. "New Harmony and Valley Forge."

If you look long enough, eventually you find that lightbulb filament. In the late 1970s, when he worked at the Ohio research station, Townsend happened to notice an American elm growing big and healthy along Route I-70. It was the only living American elm in sight. Townsend kept his eye on it. When the tree remained disease-free in 1980, he took cuttings. New Harmony, he named this tree. Eventually, he moved to the National Arboretum's Glenn Dale facility, taking cuttings from the New Harmony saplings with him. Meanwhile, he was also growing saplings of another American elm strain, from seeds among the thousands in the Agricultural Research Service's collection. Where in the country these particular seeds originated was unknown. But they were worth a try. Cuttings from these saplings, too, traveled with him to Glenn Dale. He called the strain Valley Forge, honoring the toughness of the Revolutionary War soldiers who withstood the harsh Northern winter in their ramshackle encampment.

Over the years, Townsend injected his New Harmony and Valley Forge saplings with the Dutch elm fungus at various times of the year and in various ways. The results were gratifying: these two strains of American elm shrugged off the disease. Neither was totally immune, but each could tolerate the fungus in its xylem without demonstrating the incidence of dying back or wilting seen in the average American elm. Townsend estimates that only 1 in 100,000 American elm trees can resist Dutch elm disease. But after inoculating thousands upon thousands of American elms, Townsend had finally hit upon two strains that could once again make all those Elm Streets in American towns live up to their names.

Six or seven commercial nurseries across the country are now growing Valley Forge and New Harmony saplings. Today, one wholesale nursery has New Harmony and Valley Forge saplings large enough to distribute to the trade. By the year 2000, a number of retail nurseries should have them for sale.

Resistant elms have commercial potential. For instance, when a Connecticut businessman, Jim Ozanne, recently bought some 500 acres in Vermont, he cast about for an agricultural product to grow on his Greenrange Farm, in Whiting. Hearing about Denny Townsend's research, he got in touch. Now Ozanne's farm is one of the six or seven nurseries growing New Harmony and Valley Forge cuttings, with Greenrange's first mail-order sales scheduled for fall 1998 or spring 1999, according to the farm's horticulturist, Jordan Wilson.

Valley Forge and New Harmony are not the only disease-resistant American elms. A nonprofit organization in New Hampshire, the Elm Research Institute, distributes a mixture of strains collectively called the Liberty elm. And the Princeton elm, developed by Princeton Nurseries, in Allentown, New Jersey, has proved it can stand tough against Dutch elm disease. But Denny Townsend says the new National Arboretum trees seem the most promising so far, and they have elm enthusiasts fired up.

In Cincinnati, for instance, businessman William F. Monroe has organized nurseries, city foresters and garden clubs, as well as interested citizens, to bring back the elm to Cincinnati and northern Kentucky, with 600 resistant young trees now growing at the Ammon Wholesale Nursery in Burlington, Kentucky. One part of the effort, organized by the city of Cincinnati, involved planting Princeton elms along Martin Luther King Drive and other thoroughfares. Monroe is now a big fan of Valley Forge and New Harmony, he says, and they will become an important part of the Cincinnati planting program.

Back in Maryland, Denny Townsend is gazing fondly at his New Harmony and Valley Forge saplings. "These trees will spread the resistant germ plasm needed to maintain the species," he says.

Townsend and his fellow elm resuscitators now have their own Washington monument: in a ceremony on June 6, 1996, on the U.S. Capitol grounds, federal workers planted one of Townsend's new Valley Forge elms. "But there are even better elms to come," Townsend predicts.

That is why he is keeping an eye on that elm growing so healthily on the sanatorium grounds near his Maryland laboratory. It might have those magic genes.

Writer Richard Wolkomir hopes the new elms will be planted in his Hudson River hometown. Photographer Cameron Davidson ranged across Midwestern and Middle Atlantic states to shoot this story.

After two onslaughts of blight, the 300-year-old National Champion American elm, a standout survivor, rises into the future.

Splash Spectacle

AT THE SMITHSONIAN'S COOPER-HEWITT, NATIONAL DESIGN MUSEUM, AN EXHIBITION CELEBRATES THE FROTHY AND ETERNAL ALLURE OF FOUNTAINS ◆ BY DOUG STEWART

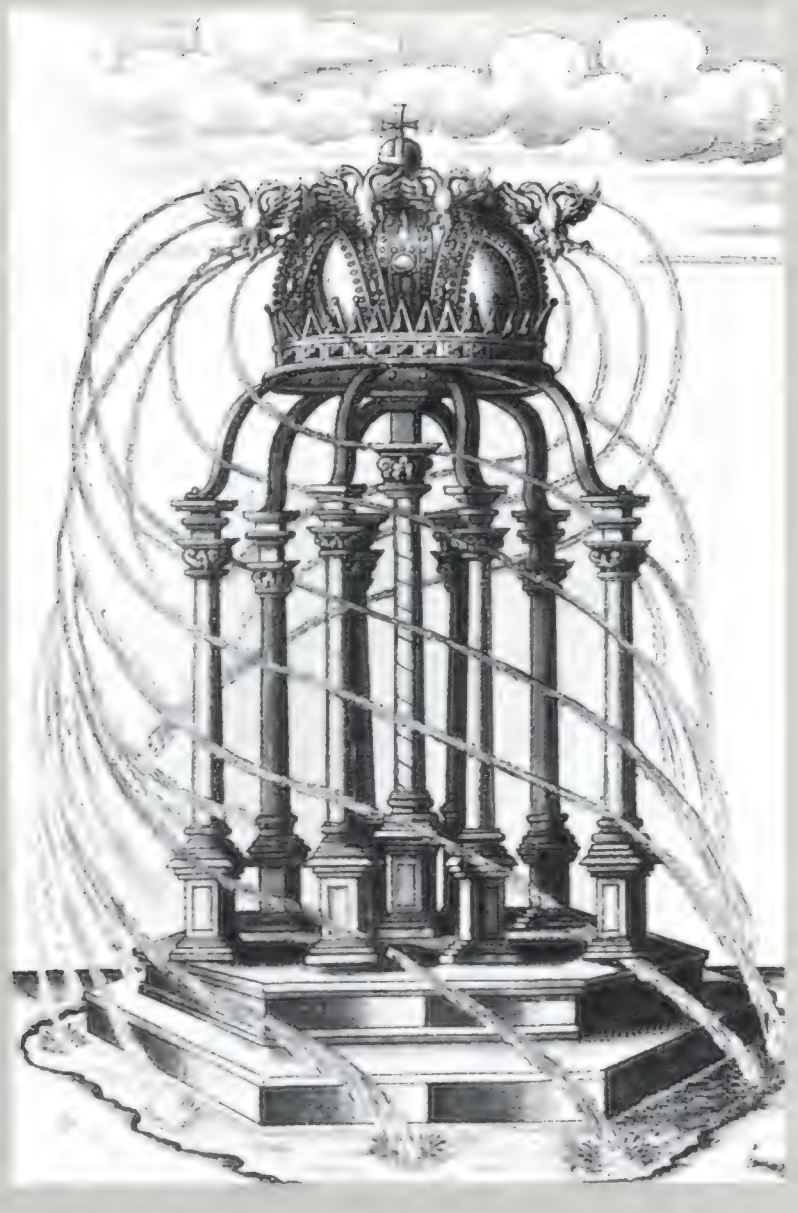
IN THE HANDS OF A bold designer, a fountain, like a chair, can look like almost anything. Alexander Calder's first major commission, for the Spanish pavilion at the Paris Exposition of 1937, was a large indoor fountain that used mercury instead of water. The liquid metal darted across a series of shallow, pitch-covered dishes and onto a chute. Before spilling into a 4-foot-wide reservoir, the shiny droplets collided with the base of a wire mobile 8½ feet high, setting it wiggling. One visitor was entranced at the mercury's ability "to collect itself into a mass, to scatter, to roll from time to time in melting pearls." If anyone doubted Calder's creation was indeed a fountain, the artist could offer proof: tourists threw coins into it! (To the artist's delight, the coins always floated.)

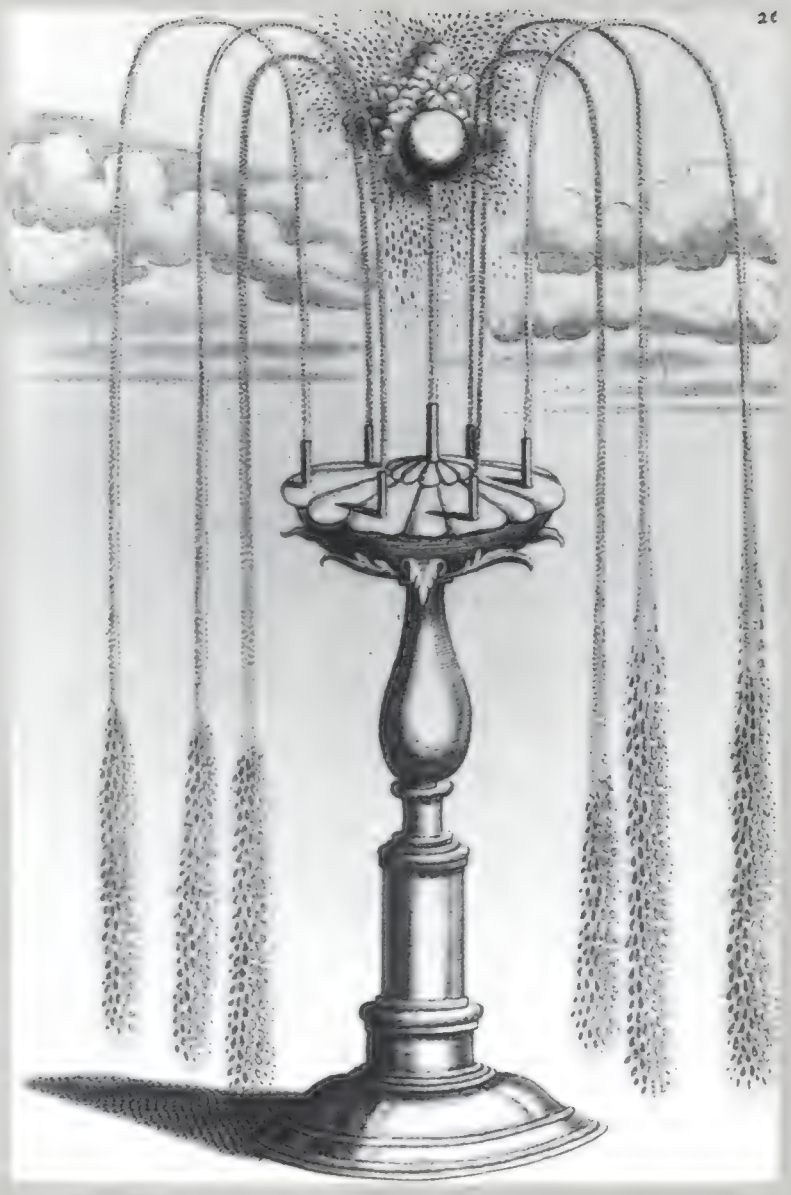
Fountains normally spurt water, not mercury, of course. Even so, fountains are perhaps the most mercurial of all art forms. Since the Renaissance and before, they've teased the imaginations of artists while testing the know-how of engineers. Water can't be shaped with a chisel or a mold, but in the hands of a fountain designer it can be coaxed into an endless number of forms: geysers, cascades, trickles, tubes, moving sheets, clouds of spray, even ice and steam. Small wonder that fountains can affect us in such dramatically different ways—thrilling us, calming us, sometimes scaring us.

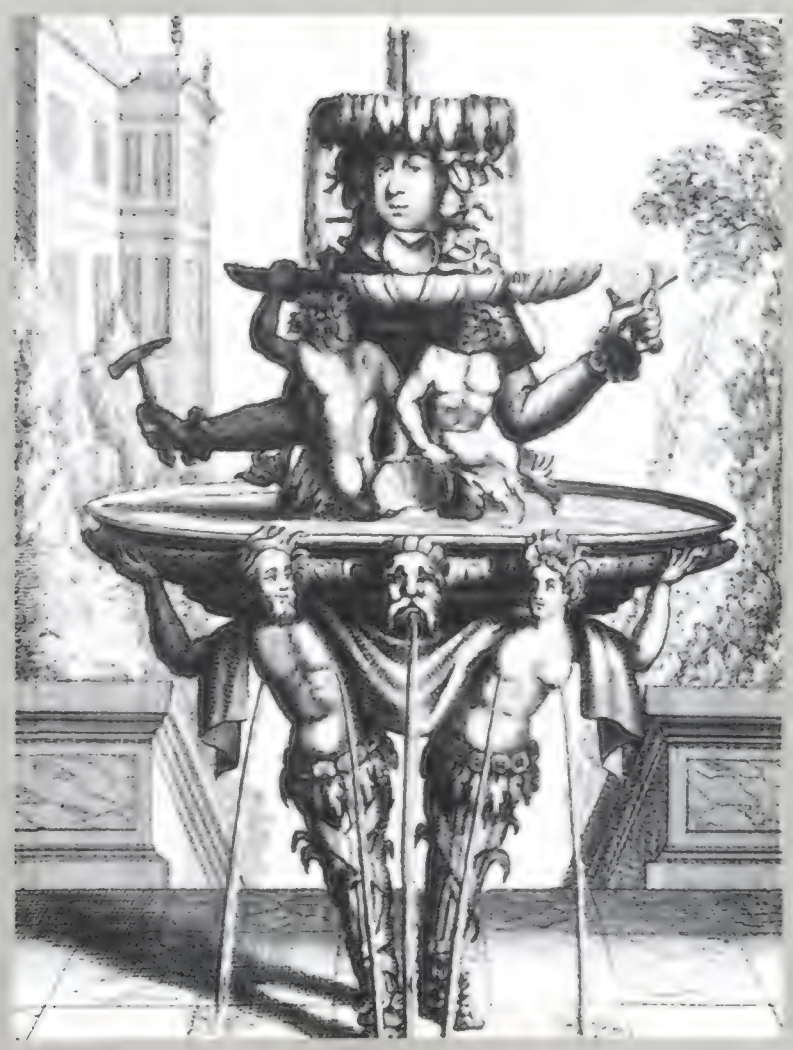
From June 9 through October 11, the Smithsonian's Cooper-Hewitt, National Design Museum in New York is presenting the first major exhibition on the design of fountains. Pulling together more than 250 rare drawings, prints and photographs, along with video clips, "Fountains: Splash and Spectacle" will explore fountains and their varied uses from the Renaissance to the present.

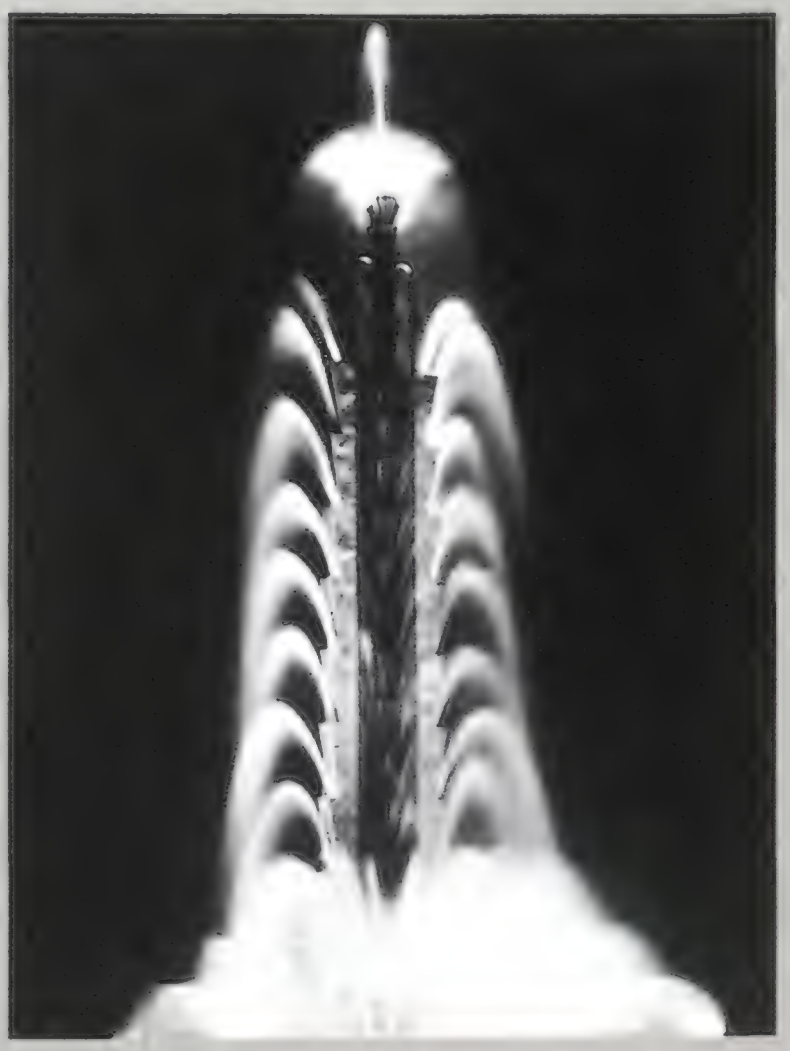
Marilyn Symmes, the Cooper-Hewitt's curator of drawings and prints, masterminded

Fountains, ancient to avant-garde, exude enchantment: the watery extravaganza above, in Tivoli, Italy, dates from 1568; in Los Angeles, dancing waters (left) surround a Jacques Lipchitz sculpture.









Images of fountains imaginary and real include (clockwise, from top left): a dizzying display topped with the crown of the Holy Roman Emperor; a fantasy featuring an orb held aloft by an aqueous jet; an Art Deco offering constructed for a 1931 exposition in Paris; a tribute to a fountain maker, the tool-wielding artisan serving as the central figure.

the exhibition and edited the companion book of the same title from the publishers Thames & Hudson/ Rizzoli International. For years, Symmes has been aware of the museum's rich trove of historic drawings of fountains, many of them 16th- to 18th-century designs that for one reason or another were never actually constructed. "Some of these fountains were probably impossible to build," she explains. Prints from the 17th century depict balls balanced on vertical jets, streams of water twisting in physics-defying trajectories, even an early example of a solar-powered fountain. "What these drawings and prints show," she says, "is the immense wealth of the imagination."

The earliest fountains were strictly utilitarian, public watering places where villagers would gather to fill their jugs and to water their livestock. To keep the various species from sharing troughs, fountains evolved multiple tiers—higher basins for humans, lower ones for animals. As cities grew during the Renaissance, fountains became accordingly more ornate. The hierarchy of tiers was reinforced by the addition, in descending order, of gods, nymphs, Tritons and lesser creatures. Neptune, the god of the sea, typically presided over the whole confection, on top, trident in hand. "Monumental fountains were a way for the ruler of a great city to show how generously he provided public amenities for his subjects," Symmes says, "and, by extension, how potent he was in harnessing the forces of nature."

"Monumental fountains were a way for a ruler to show how potent he was in harnessing nature."

The apotheosis of fountain-as-propaganda was the waterworks at Versailles. To do the self-styled Sun King justice, Charles Le Brun conceived a fountain of Apollo (Louis XIV's mythological stand-in) rising from the sea at daybreak. The deity was depicted as a windblown charioteer rising from a reflecting pool, his arrival heralded by geysers of water in jubilant fleurs-de-lis. Because Louis happened to choose a landlocked valley for his chateau and gardens, he wound up spending more on his hydraulics projects than he did on the palace's artwork. Symmes shows me an etching labeled "La Machine." The subject, constructed in 1685, is an ominous contraption the size of a house, powered by 14 giant waterwheels. "This pumped water from the Seine 300 feet up to an aqueduct, which then carried it about 20 miles by gravity to Versailles. It was an astonishing feat in its time."

A descendant of such self-congratulatory waterworks—the world's fair fountain—proclaimed the glories not of monarchs but of nations. An earnest if bizarre tribute to American industrial might was a hydraulics display at the Philadelphia Centennial Exposition in 1876. A chugging circle of steam pumps, turbine waterwheels, hydraulic rams and other machines spewed arcs of water into a pool, while a 36-foot waterfall dumped 30,000 gallons a minute into the middle. In a more refined vein, the 1931 Exposition Coloniale in Paris proclaimed the French empire's cultural supremacy with breathtaking spectacles like Le Grand Signal, an Art Deco tower festooned with delicate plumes of illuminated spray. The spirit of world's fair razzle-dazzle lives on today in Las Vegas, where lavish water displays help people forget they're in a desert.

Fountains can amuse as well as impress, and a portion of the Cooper-Hewitt exhibition is devoted to the phenomenon of trick fountains. These were popularized in Europe in the 16th century at certain imposing estates, including the Villa d'Este, Cardinal Ippolito d'Este's amazing hydraulic city at Tivoli, Italy (p. 51). "You might step on a stone that would activate a squirt from an unexpected direction and find yourself suddenly drenched," Symmes says. Statuary here and elsewhere was liable to spurt water from any conceivable orifice. Brussel's popular Mannekin-Pis fountain (1618) depicts a naked boy casually releasing a stream that, legend has it, quelled a fire and saved the city. The Belgian Tourist Office proclaims the lad represents "the very spirit of freedom." On special occasions, the statue emits wine or beer.

Water in motion can invite contemplation as well. Sounding Stones, Maya Lin's Zen-flavored 1996 fountain on the edge of New York's Chinatown, is a row of four rough-hewn granite blocks, akin to the philosopher's stones prized by Chinese scholars and monks. Water trickles down inside the blocks, mostly out of sight. Through small holes bored in the sides the visitor can hear and glimpse the water's movement and, at the same time, feel its cooling splash on a hand.

In postwar fountain design, abstraction has replaced the gushing nymph and cherub. One extreme is a recent work by California landscape architect Peter Walker that uses not water—nor any above-grade structure at all—but rather the absence of water. Walker's fountain (if that's what it is) consists of a perforated, hoop-shaped pipe lying at the bottom of a lake. Air pumped into the pipe leaves a soft white ring of bubbles visible from shore. For his Upward Falling Fountain, New York engineer-turned-artist Wen-Ying Tsai uses a rapid-fire strobe light to make precise rings of falling droplets appear to be drifting upward. The strobe light's firing rate is sound-activated. When I visit his studio, my laughter makes the

rings of water seem to jerk suddenly upward, as though the nozzles were sucking the drops back in.

Outside, in contrast, one stark corporate plaza after another in Manhattan is dressed up with nondescript water walls and low jets that are arranged as predictably as chess pawns. "I call these zoning-bonus fountains," architectural historian Andrew S. Dolkart tells me when I join him for a fast-paced tour of midtown. Developers provide small public spaces at the base of their skyscrapers, he explains, in return for the right to build extra floors. Too often, the fountains are merely afterthoughts. But there are exceptions.

Dolkart takes me to the Heron Tower on East 55th Street, a recent Kohn Pedersen Fox design that hides a tiny tour de force of hydraulic art. Tucked behind the tower's narrow lobby is a small chamber sealed off behind a glass wall. At the back of the chamber is a single jet of water, spurting silently and out of reach. The jet is barely three inches high, but there's a trick: the chamber's floor slopes up, and its walls angle in; columns on either side shrink as they recede. The result is a delightful illusion that the lobby opens onto a grand Brunelleschian arcade with a fountain in the distance. "It's a very narrow building and a very small lobby," Dolkart says. "This gives the interior a wonderful sense of space."

Even the humblest flow of water, if handled well, can add a touch of animation and serenity to otherwise drab surroundings. In my bachelor days, I dressed up an old claw-foot bathtub in my Cambridge, Massachusetts, apartment by running a narrow hose from the faucet up behind a large plaster lion's head I'd found somewhere. I never tired of watching the graceful arc of steaming water shoot from the lion's mouth and plunge into the bubble bath. My seedy apartment may have lacked a shower, but I bathed in class. I decommissioned the fountain on the evening the hose slipped from behind the lion's mouth and onto the floor as I waited in another room for the tub to fill. The mishap was brought to my attention by my downstairs neighbor, who phoned to report her bathroom ceiling had just collapsed.

Tucked into a Houston courtyard, a fountain recalls a mountain stream.

Obviously, fountain design is no task for amateurs. Even well-designed fountains can make trouble. The Achilles' heel of all things hydraulic is maintenance. In many cities, broken fountains seem to outnumber the working ones. An operating fountain is always wet, and water, over time, is a corrosive fluid. Municipal budgets rarely cover the cost of, say, expanding an underground chamber beneath a fountain so workers no longer have to drain the basin all day to change a lightbulb. For this and other repairs to Stirling Calder's glorious Swann Fountain in Philadelphia, a private save-the-fountain campaign had to raise $2.3 million. The Swann is one of a number of U.S. fountains built between 1910 and 1930, as part of the City Beautiful movement, that were recently restored after energetic fund-raising campaigns. Others include New York's Pulitzer and Lowell Memorial fountains, at Grand Army Plaza and Bryant Park, respectively, and Chicago's spectacular Buckingham Fountain. An assessment of the funds needed to renovate Philip Johnson's Fort Worth Water Gardens, only 26 years old, matched its original construction cost of $3 million.

Nonetheless, to those who value the splash of water in the middle of a city, fountains will always be worth the cost. No one knows what wishmaker first tossed a coin in a fountain, but from ancient times people have left offerings at wells and springs to keep the water coming. The tradition of tossing offerings into fountains

At the FDR Memorial designed by Lawrence Halprin, fountain waters shimmer in the darkness.

shows no sign of abating today. Each year, visitors drop about $2,000 in pocket change into the fountain at the Smithsonian's Arts and Industries Building; the money helps fund internships in the Horticultural Services division. "We finally purchased a coin-cleaner in partnership with the Hirshhorn, which also has a fountain," says the division's Paul Lindell, who helps to oversee semiannual pool drainings to scoop up the money. "The banks won't take it dirty."

Aside from their wish-fulfillment value, fountains are probably most popular for bringing a dollop of nature to congested urban "hardscapes." Water can do this in surprising ways. Architects Philip Johnson and John Burgee strove for an ambitious simulation of nature at Houston's Transco Waterwall (p. 57) in 1985. This is to fountains, I realize, during a visit, what stretch limos are to cars. Set off with its own gabled archway, the water wall looms theatrically above a grassy promenade leading to Johnson's Transco Tower, a suburban office monolith that itself gives new meaning to the word "grandiose." The water wall discharges 11,000 gallons of water a minute from a height of 64 feet. (Rest assured: as in other fountains, the water is recirculated.) The cascade doesn't disintegrate into spray but clings to the curving wall in a pleasingly cohesive froth. As I stand at the base with the falls forming a half-circle around me, I realize I'm in the one spot in the neighborhood where the sound of lawn mowers and leaf blowers is drowned out. Newlyweds have taken to posing for their wedding pictures here, this being as good an approximation of the Horseshoe Falls as the Sun Belt has to offer. With the weather damp and raw today, however, it's mostly me and the 11,000 gallons a minute.

Fountains are probably most popular for bringing a dollop of nature to urban landscapes.

Houston is awash in architectural fountains. A much more subtle treatment is on Smith Street near the Cullen Center, downtown (opposite). After a fair bit of searching, I find the octagonal pool in a low, secluded side courtyard. Beneath the water's surface, an 8-inch-by-6-foot notch has been sliced into the basin's floor, and water on both sides curls into the narrow cut in smooth, heavy sheets. The hole in the water is barely noticeable from the upper plaza. The best view, oddly enough, is through a narrow gap in the courtyard's high outer wall, which affords passersby an intimate glimpse of the converging sheets.

Landscape architect Kevin Shanley of Houston's SWA Group, who designed the fountain, tells me he was inspired by the high meadow streams he used to enjoy as a mountain climber. "During snowmelt periods, you see this heavy, rich, clear water zipping along like fluid glass. It's limpid and passive-looking. Then you put your hand in, and its force is incredible." He tried to re-create the same kind of heavy water, as he calls it. Fountain designers usually aerate; bubbly water catches the light better, makes more noise and is cheaper to pump, being lighter. But, says Shanley, "sometimes accepting less effect is more beautiful." I ask why he tucked

Water spatters and pops into the air unpredictably from 250 small nozzles, the timing determined by an underground computer.

the fountain into such an out-of-the-way spot. "I think cities need places like that," he says.

If Shanley was inspired by sticking his hand underwater, landscape architect Dan Kiley imagined walking on the surface. Kiley, with his partner, Peter Ker Walker, conceived one of the wettest urban plazas in the world, Fountain Place in Dallas. In the shadow of I. M. Pei's brutally austere First Interstate Bank Tower, the park is a three-acre oasis of fountains, cascades and reflecting pools. Protruding from circular concrete basins brimming with water are the trunks of 220 bald cypress trees. When I step back, I can see a dense forest growing in a lake.

"People don't walk in the woods enough," Kiley tells me from his office in Charlotte, Vermont. "Cities need forests, and they need water." When he first visited the site, he vowed not to give Dallas another hot, reflective, hard-paved plaza. "I said, 'Let's make this a place that's all water—where you can almost walk on water.' That's why we made the pools flush with the paving."

The centerpiece of Fountain Place is a tightly packed grid of nearly 250 small nozzles that are set into a central courtyard. Water spatters and pops into the air unpredictably, the timing determined by an underground computer. A man holding a camera waits patiently for the jets nearest him to erupt; his wife and small son pose with their backs to the fountain, giggling nervously.

I join Johnny Thompson at an outdoor table a few yards away. Affable and well-spoken, Thompson has just come from church and is wearing a green double-breasted suit. The former security guard moved here from a small Texas town on the Brazos River 17 years ago. He now lives in a homeless shelter. "I'm not so homesick sitting here," he says, "because I feel like I'm surrounded by the woods and water of home. People are usually friendlier here, too, the way they are in small towns. You can come here and enjoy nature, the water and the squirrels and the trees." Thompson leans back and smiles.

A welcoming, accessible fountain often can induce a smile. This is especially true of those created by WET Design, the Los Angeles water wizards who designed that city's Music Center Fountain 11 years ago. Since then, WET (for Water Entertainment Technologies) has installed its high-tech fountains all over the world, notably in Asia. One of WET's specialties is stylish, amusing pieces that don't necessarily use much water. This is evident as soon as I step inside its design studio in Universal City. In a corner of the reception area is a small sunken pool; above it, a tiny hole in the ceiling. Every few seconds, a drop of water plunks into an opening in a half-submerged Brazilian amethyst that is the size of a giant clam.

Mark Fuller, the company's president and cofounder, is a Stanford trained civil engineer who once worked as a Disney theme-park "imagineer." In the early 1980s, he helped devise EPCOT Center's much-imitated Leap Frog Fountain, an installation that squirts short, glassy bursts of water as smooth as wet soap. (Part of the secret is a gizmo inside the nozzle that looks like a bundle of soda straws.) "When we started," Fuller says, "using water as an artistic medium was a field that was ripe for innovation."

One result of WET's explorations is the fountain at Universal City Walk, an outdoor mall nearby. Buried in the pavement of a central courtyard is an array of several hundred NanoShooters, which eject about a beer stein's worth of water per burst. The air-powered jets spout singly, in

At an atrium in City of Industry, California, parabolic streams create a water sculpture.

Houston's 64-foot-high Transco Waterwall discharges 11,000 gallons of water a minute.

pairs, in rotorlike waves. I watch a young boy creep across, covering the holes with his high-top red sneakers in an unsuccessful attempt to keep dry. An older, more carefree boy bends over and waits for a nozzle to splash him in the face, which it does. Even when all the nozzles fire at once, filling the air with froth, the water quickly disappears in gaps between the paving stones. The mysterious absence of all hydraulic paraphernalia is part of what makes WET's creations seem so magical.

A more theatrical embodiment of the WET esthetic is the Water Court at California Plaza in downtown L.A. An elaborate series of water-covered terraces, basins and water walls, the fountain calls to mind the set of a Busby Berkeley musical. Water burbles up in waves and chases like a chorus line, accompanied by whooshes, chugs, splatters, pops and boings. Periodically, a mini-tsunami crashes down, tier by tier, and laps out onto the courtyard itself.

Jim Garland, design codirector at WET, is an exuberantly opinionated architect who disdains the classical style in fountains, which is highly sculptural and laden with symbolism. "We're interested in water," he says. WET has often been called in to renovate existing fountains—Paul Manship's 1934 Prometheus Fountain at Rockefeller Center, the Mirage casino's volcano in Las Vegas (which erupts in water, not lava) but the company prefers to start from scratch. "We're working on a new feature in Las Vegas that's one-fifth of a mile long," Garland says. Opening later this year, the water-and-music extravaganza at the Bellagio hotel and casino will use close to 1,000 water-launchers submerged in a lake. Some of the devices can pop a barrel-load of water 250 feet in the air. "I'm telling people it's going to be on a U.S. postage stamp—it's that kind of fountain."

Whether fountains should get you wet is a topic about which designers, clients and the public have divided opinions. Lawrence Halprin, the designer of Washington's new Franklin Delano Roosevelt Memorial (SMITHSONIAN, May 1997) with its dramatic cascades of water, has always made his pools immersion-friendly. Last July, however, after children began showing up at the memorial with bathing suits and beach towels, the National Park Service stepped in. Concerned about safety and decorum, it declared the site a no-wading zone.

West Palm Beach mayor Nancy Graham disagrees with that approach. "You can worry too much about litigation," she says, and she's a lawyer herself. West Palm Beach, despite its name, isn't on the ocean. To make up for this, and invigorate an ailing downtown, the city recently commissioned Dan Kiley and a firm called Team Plan to create a pavement-and-jet-style fountain for a habitually deserted public square. When families, day-schoolers and summer campers began frolicking in the fountain, Graham had its official designation switched from "fountain" to "pool," upped the chlorine level and hired lifeguards. When dripping children began trooping into the public library to use the toilets, she made sure the library put down nonskid carpeting.

"Everybody comes—white, black, Hispanic, seniors. It's free family entertainment!" Graham is old enough to be a grandmother, but she, too, has been known to run through the fountain fully clothed. "It's helped us bring people back to our downtown. We'd be crazy to keep them out of that fountain."

Doug Stewart wrote about the new Times Square in the February issue of SMITHSONIAN.

Alex Trotman
Chairman of the Board
Ford Motor Company

Dear Mr. Trotman:

I work in Product Development. So when our team comes up with a new idea, the whole world gets to see it driving down the road. That's a great feeling.

But the fact is that Ford is full of other people who are doing their jobs in new and different ways, and the world may never know about them. Like the people making our factories more efficient and environmentally friendly. Or the folks working in crash test or recycling or alternative-fuel vehicles.

Wouldn't it be great if we could gather up achievements and innovations like these and start sharing them with each other (maybe even with the people who inspired those ideas, our customers)? It'd be educational and inspirational for us all.

What do you think? Is this doable?

Yours,

Dustin G. Ratliff

Dustin G. Ratliff
Design Engineer

Great idea!
Let's do it
/ Alex

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TO: ALL
FROM: FRANCISCO JAVIER BERTAUD

We just spent the morning building nesting cavities for ducks. And yesterday we planted wildflowers and a new species of cactus.

That may seem a little unusual for someone who works for a Ford assembly plant but you see, I'm the official biologist. our facility in Cuautitlan, Mexico is home to lots of wild geese, falcons, lizards, and shrikes.

Our team of 15 people works full time to preserve and enhance the wetlands and wildlife in our 260-acre compound. A few feet from where our coworkers build F-series trucks, we're planting thousands of trees and the hummingbirds are laying eggs

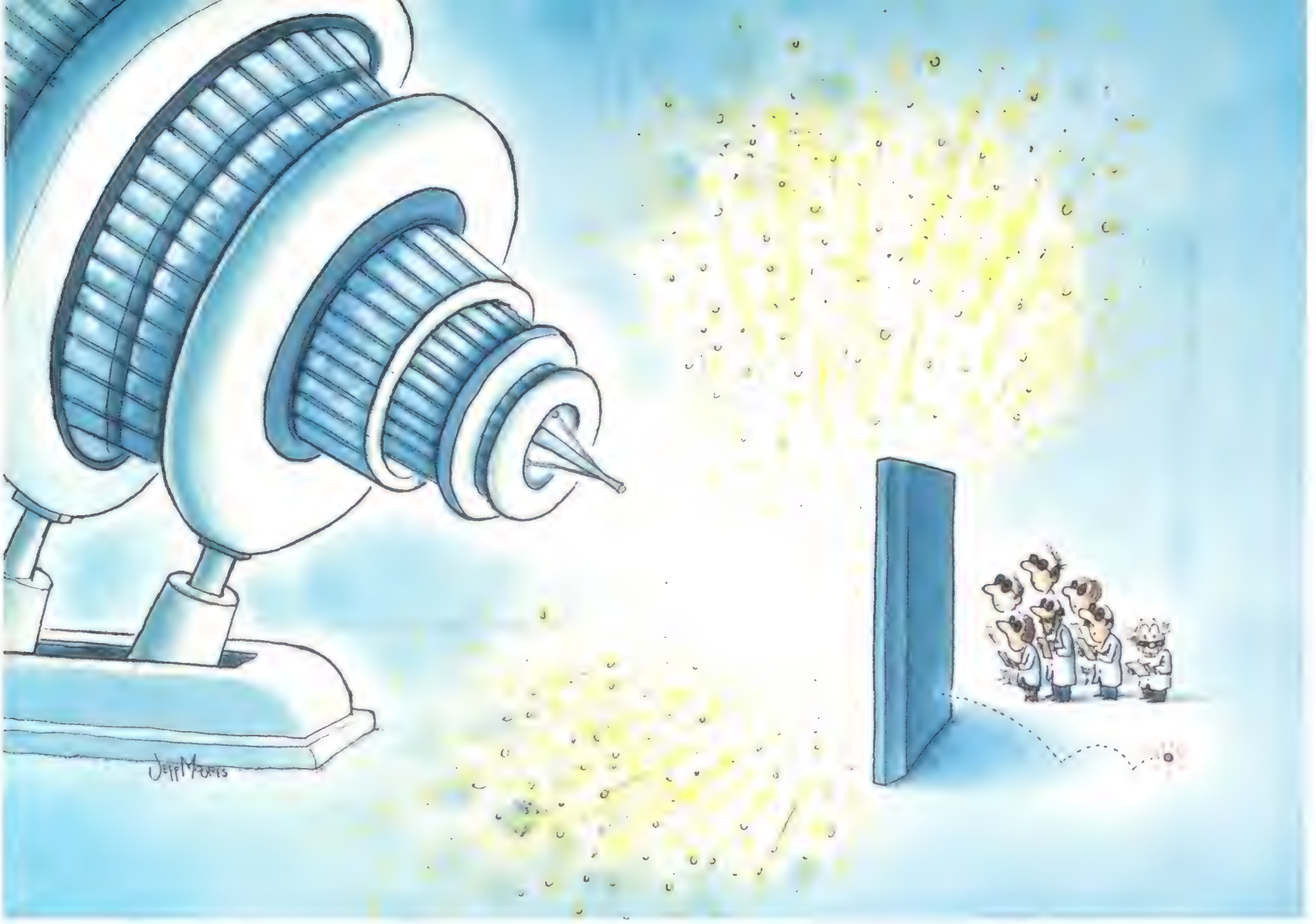
I have a nice job, don't you think?

FRANCISCO JAVIER BERTAUD

who needs chemical abrasives? in Germany, We use crushed walnut shells.

FRANCISCO JAVIER BERTAUD

ENVIRONMENT



When an accelerator, left, fires a beam of particles at a target, debris results. Some, lower right, may be antimatter.

Greetings from the

antiworld

EVERY SUBATOMIC PARTICLE HAS ITS OPPOSITE NUMBER, BUT LUCKILY IT'S NOT TRUE ON A LARGER SCALE

"Warp five, Scotty."

"Aye, Captain."

Any *Star Trek* aficionado can tell you what happens next. Deep in the bowels of the starship *Enterprise*, valves open so matter and antimatter can flow together through the dilithium crystal; the ship moves off at warp speed.

Well, warp speed is pure science fiction. So is the dilithium crystal. Antimatter is another story. It exists all right, but it is strange stuff—surely one of the strangest beasts that we humans have encountered.

It's rare. Even in the depths of space, where all manner of strange things dwell, it accounts for less than one particle in a million. Although we can and do make antimatter in our laboratories, the amount we make is minuscule, and the cost is astronomical.

Finally, antimatter is, pound for pound (or even nanogram for nanogram), the most powerful source of energy in the Universe; it far exceeds the output of nuclear fission or fusion. A bit of antimatter weighing less than a small paper clip would be more than enough to launch the space shuttle.

Because antimatter's potential as rocket fuel is so enormous—even though no one knows how to produce or store enough—both the Air Force and NASA have quietly funded small-scale research over the years. It is for other reasons, however, that interest in this esoteric stuff has been picking up lately. Even though scientists detected the antimatter version of electrons in the laboratory more than 60 years ago, it is only now that they have been able to make the antimatter version of atoms. Meanwhile, astronomers have found what appears to be a fountain of antimatter squirting up from the center of our galaxy.

BY JAMES TREFIL ▪ ILLUSTRATIONS BY JEFF MOORES

To get a handle on antimatter, you have to realize that everything around us is made, ultimately, from a small number of elementary particles. Particles called neutrons and protons clump together to form the nuclei of atoms, and other particles called electrons go into orbit around those nuclei to make atoms.

In the early part of this century, we found that our ordinary world is complemented by another, stranger world, that of antimatter. In the "antiworld," the basic building blocks are antiparticles, instead of the familiar protons, neutrons and electrons. Antiparticles are nearly identical to their counterparts—having, for instance, the same mass, amount of spin and amount of electrical charge—but are exact opposites in at least one crucial way. If the ordinary particle has a positive electrical charge, then the antiparticle's charge will be negative. In some cases, if the particle has a clockwise spin, the antiparticle will have a counterclockwise one. If it made sense to say that a particle was white, then an antiparticle would be black, but otherwise their appearance would be identical. Particle and antiparticle, in other words, bear roughly the same relationship to each other as photograph and negative.

OVER THE YEARS, WE HAVE DISCOVERED A BASIC law of nature pertaining to the antiworld. Whenever we find a particle in our laboratories (and we have found hundreds of different kinds), sooner or later we will be able to detect its antiparticle. Are nuclei made from protons? Then we will be able to make antiprotons in a laboratory. Do we believe that protons and neutrons are made from even more fundamental particles called quarks? Then there will have to be antiquarks as well. Furthermore, in theory, the rules that govern this antiworld should be pretty much the same as the rules that govern our ordinary world. In most cases one would expect absolutely no difference between what happens when ordinary particles interact and what would happen to their corresponding antiparticles in a corresponding situation in the antiworld. When a particle and its antiparticle come together, however, all hell breaks loose. The representatives of the anti- and ordinary worlds disappear in an explosion, and their combined mass is replaced by an enormous burst of energy and a cloud of secondary particles.

In an isolated antiworld, antipeople would go about their lives the same as we do. When an antiperson flipped an antiswitch, antiatoms in the antilightbulb would give off the same kind of light that you are using to read these words. There would be no annihilation going on, because there would be no ordinary matter involved. If, however, you happened to be transported to this antiworld, and tried to shake hands with your antiself, the two of you would disappear in a titanic explosion. In that explosion your bodies would be converted almost entirely into pure energy; all that would be left would be electromagnetic radiation and a thin cloud of particles.

If, as seems to be the case, there is some sort of equivalence between matter and antimatter, you might expect antimatter to be fairly common in the Universe. It is not. Until the early 1930s, in fact, no human being had seen so much as a single antiparticle. In the summer of 1932, a young Caltech physicist by the name of Carl Anderson had just finished putting together an experiment to explore the nature of cosmic rays. These are high-energy particles that rain down continuously from space—they are going through your body at the rate of several per minute right now. These particles often collide with atoms high in our atmosphere, and physicists were looking at the debris of these collisions—in an apparatus called a cloud cham-

An astronaut tests whether planets are made of antimatter by landing on them. The last one, unfortunately, is.

ber—to learn what goes on in the nuclei of those atoms.

When Anderson started watching his apparatus, he saw tracks left by all sorts of familiar particles: electrons, protons (which are the nuclei of hydrogen—the simplest atoms) and more complex nuclei. On August 2, 1932, however, something quite unexpected showed up. A particle that had the same mass as an electron had passed through, but this particle had a positive charge. As it turned out, this was the first bit of antimatter ever seen by a human being. Anderson dubbed his find the "positron," a contraction of "positive electron," and went on to find 14 more before he published his findings in March 1933.

The British physicist Paul A. M. Dirac had begun to postulate the existence of the positron in 1928, four years before it was first seen. The best way to visualize Dirac's theory is to picture a level field, and then to imagine digging a hole in it. When you are done, you will have two things: a pile of dirt and a hole in the ground. In a sense, the hole is a mirror image, a negative of the pile. Dirac identified the pile with the ordinary particles and the hole with their opposing antiparticles.

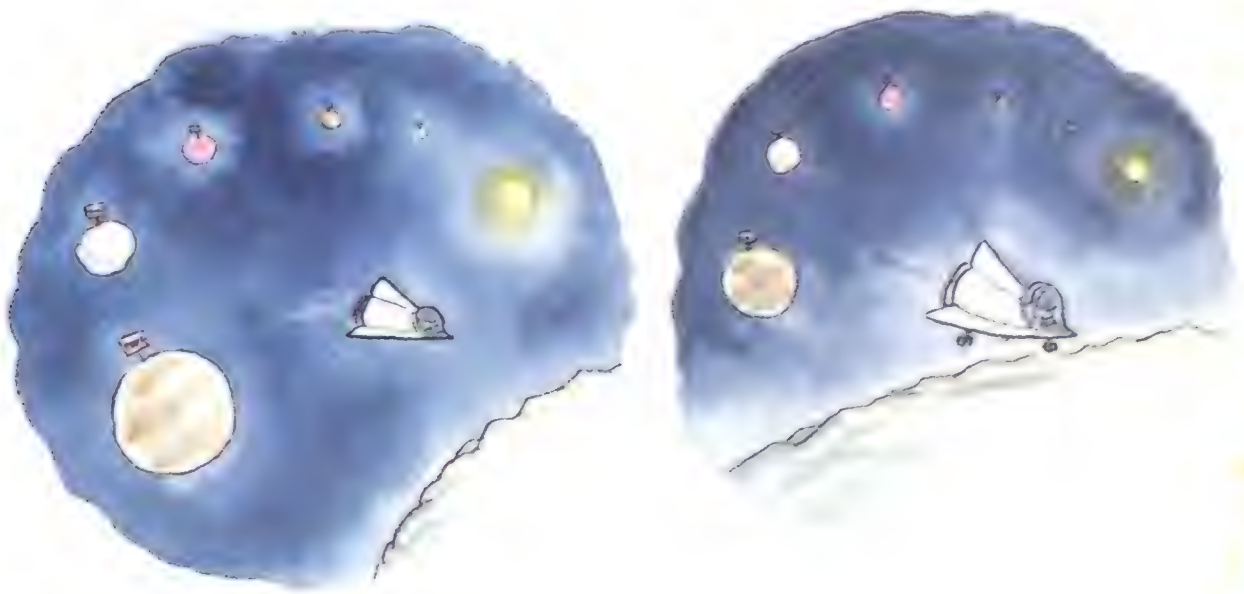
If you picture things this way, some features of antimatter are a little easier to understand. For example, the masses of the particles and the antiparticles are equal: and there is always as much dirt in the pile as was removed from the hole. The pile stands above the ground (positive), while the hole is below it (negative).

The picture also explains something else. When an antiparticle is created in a high-energy collision, the corresponding particle is always created as well. In the analogy, this makes sense: you can't dig a hole without making a pile of dirt at the same time. In this view, an antiparticle can be thought of as the *absence* of a particle: a hole waiting to be filled.

The initial discovery led to an expectation that the "anti's" of other particles would turn up in nature. Attention naturally turned to the proton, the heavy, positively charged particle that exists inside the nuclei of all atoms. For decades, physicists searched in vain through the debris of cosmic rays for a particle as massive as the proton but with a negative charge. The late Robert Golden finally found some in 1979.

IN THE MEANTIME, PHYSICISTS TURNED TO ACCELERators. In 1948, a young scientist named Owen Chamberlain moved to the Lawrence Radiation Laboratory at the University of California at Berkeley. (It is now called the Lawrence Berkeley Lab.) There, within a few years, an accelerator called the bevatron—named for the many billion electron-volts (BeV) it would achieve—would be built on a hill overlooking San Francisco Bay. It would take protons, accelerate them to high speeds and smash them into solid targets. Chamberlain realized that this machine could answer the question of whether the proton had an antiparticle. He and his colleagues estimated that when the speeding protons hit their target (a block of copper), the spray of debris should contain about one antiproton for every hundred thousand ordinary particles. Their problem: to find that one particle in the flood of other negative particles.

The group developed a technique that would eventually come to characterize much of high-energy physics. It depended on channeling possible antiparticles through a chain of instruments, subjecting them to tests that only an antiproton could pass. In the first test, the particles created in the collision encountered a magnet that would deflect an antipro-



ton by a known amount. A particle deflected by just this amount would pass through a slit in a lead shield, and anything not deflected in this way would be scattered or absorbed by the lead. Like a soldier giving a different password as he passes each new guard post, antiprotons moving through Chamberlain's apparatus had to pass through one test after another. The particle was to be considered an antiproton only if it gave the right "answer" each and every time.

SO STRINGENT WERE THE TESTS, IN FACT, THAT when the experiment first got turned on, not a single particle got through. "We didn't see a darned thing," Chamberlain commented in an interview. When they checked, they found that they'd made a mistake that, in effect, made the apparatus throw out any antiprotons that entered. "Once we fixed it, we got our first antiproton in a few hours," Chamberlain recalled.

"We were high on adrenaline for weeks," he said. "I'd work all day on one experiment, all night on the antiproton, write the next day's lecture between three and four in the morning, catch up on a little sleep, and then be up and going in the morning. I've never seen myself with the stamina that I had then."

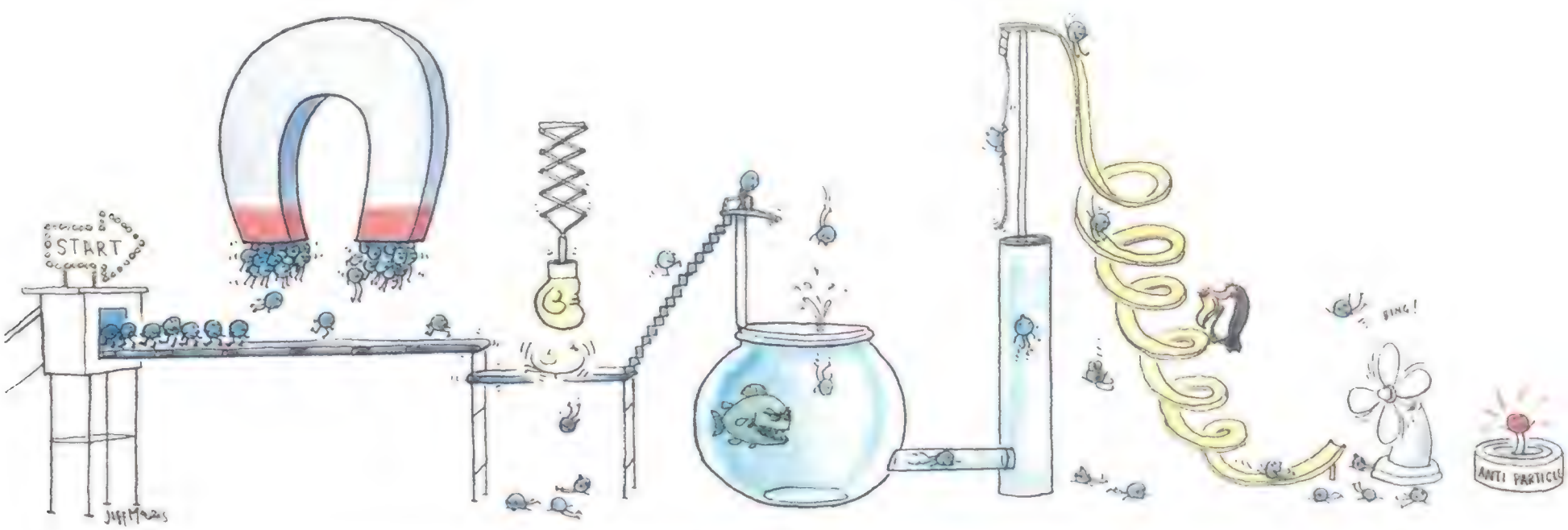
As the antiproton events started to accumulate, rumors started buzzing around the lab. "Nowadays we'd have had the whole press corps on our heels," Chamberlain laughed, "but back then we just set up a blackboard so that our colleagues could see the latest results. We even included the World Series scores." By the time that they published their results, they had seen a total of 60 antiprotons, and in 1959 Chamberlain and his colleague and former teacher Emilio Segrè shared the Nobel Prize.

So—if matter and antimatter are created simultaneously—why is antimatter so rare? Why don't cars and anticars annihilate regularly when they meet on highways? Why can you shake hands with impunity, never worrying about the possibility that your new acquaintance may, in fact, be an antiperson?

We now know that the Universe began as a hot, dense, compressed collection of particles that has been cooling and expanding ever since. If, as scientists predict, the laws of nature are almost always the same for particles and antiparticles, why is the world that we see made only of matter? Why isn't the Universe made up of half matter and half antimatter?

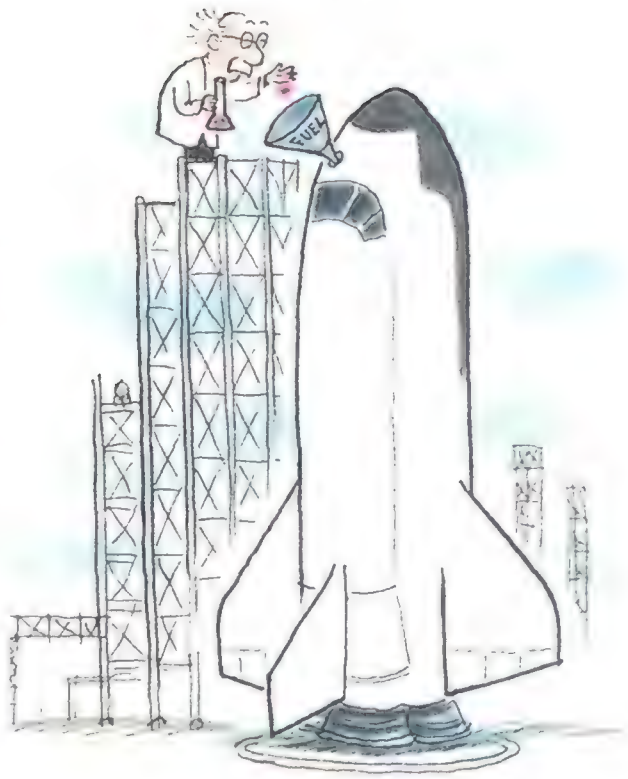
During the 1960s and '70s, some scientists thinking about this question suggested that maybe the Universe really was made this way. They produced theories in which matter and antimatter were like lettuce and tomatoes in a poorly mixed salad. We happened to wind up in a place where there is a lot of matter, but that only means that somewhere else there ought to be a place where antimatter has collected. These places would house true antiworlds: entire planetary systems, and even galaxies, made of the stuff.

To find out where we stand today, I talked to astrophysicist Gary Steigman at Ohio State University. He points out that in some ways, antimatter is easy to detect. "All you have to do is place a sample in a detector," he says. "If the detector disappears, the sample was made of antimatter." Using this criterion, we can say immediately that at least four of the other worlds in our solar system—the Moon, Mars, Jupiter and Venus—are made of ordinary matter. If they weren't, the spacecraft we have sent to them would have disappeared in a flash of radiation as soon as they encountered the atmosphere or surface.



Suspect particles are not declared antimatter until they pass a series of arduous tests.

We can use Steigman's test to go a little further, though. The Sun, Steigman points out, is constantly spitting out streams of subatomic particles that we call the solar wind. This wind blows past all the planets and out into space. If any of the planets were made of antimatter, annihilation with material in the solar wind would go on all the time, and we would see all kinds of high-energy radiation coming out. Because we don't see the radiation, we can be confident that no annihilation is going on, and hence all the Solar System is made from ordinary matter.



In principle, single pellets of matter and antimatter could launch the space shuttle.

In addition, we get occasional visitors from other parts of our galaxy in the form of extremely high energy cosmic rays. Spawned in distant stars, these particles travel through light-years of nearly empty space before hitting Earth's atmosphere. They are mostly protons, but nuclei as heavy as those of uranium have been observed raining down on our planet. They were probably produced in supernovas—explosions of giant stars—somewhere in our Milky Way galaxy.

WE FIND NO ANTINUCLEI. THERE ARE PLENTY OF antiprotons, probably produced by deep-space collisions. If regions of the galaxy were populated by antistars, some of them would become supernovas and you would expect to see reasonable amounts of antinuclei in interstellar space. "If we found even one antihelium nucleus in a cosmic ray, it would be evidence for macroscopic amounts of antimatter in the galaxy," says Steigman, but he hastens to point out that no such discovery has been made.

The last possible place where large amounts of antimatter could be hidden, then, is outside our own galaxy, perhaps in distant galactic clusters made of antistars. Here again the evidence is negative. Theoreticians have pointed out that if there had been large clusters of antimatter, then annihilation from regions of overlap early in the Big Bang, when everything was closer together, would have produced high-energy radiation that would persist to the present day. We don't see it.

"Absence of evidence is no evidence of absence," says Steigman, "but it would be churlish to ignore the data. We live in a universe with little or no primordial antimatter. If it is out there, it is in regions of space we haven't seen."

Actually, the near absence of antimatter in the Universe is no longer regarded as a puzzle by most scientists. Over the past 20 years, we have begun to learn how in the earliest fraction of a second of its existence, the future of the Universe was determined by the nature of the elementary particles of which it was composed, and we have been able to produce and study many of these particles in our laboratories.

If you've been reading carefully, you may have noticed that whenever I talk about the symmetry between matter and antimatter, I always introduce a weasel phrase like "almost always" or "almost the same." The fact is that physicists know of one exception to the rule that matter and antimatter are always symmetric: the decay of a particular kind of elementary particle. If we use our theories to extrapolate this tiny asymmetry back to the first fraction of a second after the Big Bang, we can imagine an interesting set of events playing out.

In the very beginning of the very first second, the Universe went through a phase in which there was a large-scale conversion of energy into matter: this is when most of the mass in the Universe was created. As the particles ran through their production chains, however, the tiny asymmetry ensured that for every billion antiparticles of a particular type, there were a billion and one particles of ordinary matter. In a short time, all of the billion antiparticles annihilated with the billion particles, leaving one lone particle of ordinary matter. From that lone particle and its brothers, the entire Universe was constructed—including, Dear Reader, you and me.

So because of a small asymmetry in the laws of nature, it's thought, antimatter has not been around much since. That's a good thing, because otherwise everything would have annihilated and there would be no matter around at all. "A symmetric universe is an empty universe," points out Steigman.

Since that brief, asymmetric day in the sun, most scientists believe, all the antimatter in the Universe has consisted of ephemeral antiparticles, produced by radioactive decay or, more commonly, by collisions—whether in space or in laboratories.

This is not to say that we aren't occasionally surprised by the appearance of antimatter in unexpected places. When electrons and positrons encounter each other in the depths of space, they annihilate and emit a high-energy type of radiation known as gamma rays. These rays can

be detected from Earth, and it has been known for a long time that a lot of them, at energies characteristic of positron-electron annihilation, seem to be coming from the center of our galaxy. In 1991, NASA launched the Compton Gamma Ray Observatory for the express purpose of making detailed measurements of gamma rays, including those coming from the middle of the Milky Way.

One scientist who's been involved almost from the beginning is William Purcell, who recently moved to Ball Aerospace in Boulder, Colorado, from Northwestern University. Detecting positron annihilation in space isn't easy, he says. It's only after a long and difficult set of measurements have been made that the small number of gamma rays reaching Earth from deep space can be identified.

AT THE END OF 1996, AFTER YEARS OF HAVING JUST enough time on the satellite to keep the program going, Purcell and his coworkers were given eight weeks of uninterrupted viewing time. Steadily, day by day, they used their painstaking observation technique to scan a large chunk of sky around the center of the galaxy. And steadily, day by day, a fascinating picture began to build up in their data. There, sitting 3,000 light-years above the center of the galaxy, apparently connected to it by a tenuous ribbon, was a region where positrons were annihilating furiously with electrons. The discovery was immediately dubbed the "antimatter fountain" in the press.

The results fairly beg to be interpreted as a jet of positrons being squirted up from the center of the galaxy, a jet whose eventual annihilation produced the gamma rays that were detected during those furious eight weeks. "The positrons may have been created by the action of a massive black hole at the center of our galaxy," says Purcell, or, as he prefers to believe, "in a cloud of the radioactive remains of supernovas."

As far as human production of antimatter is concerned, the largest "antimatter factory" in the world is at the Fermi National Accelerator Laboratory near Chicago (*Phenomena, Comment & Notes*, January 1990). Using a ring about four miles around, this machine accelerates ordinary protons to almost the speed of light, then causes them to crash into a target. Using modern descendants of Chamberlain's apparatus, antiprotons are picked out of the debris of these collisions and directed into a smaller ring, where they can be stored for many hours. As much air as possible is pumped out of the ring, and magnetic fields keep the fast-moving antiprotons from touching the sides. Working full tilt, the Fermilab accelerator can "stack" about 60 billion antiprotons per hour.

"Antiprotons are precious," says the former associate director of Fermilab, J. Richie Orr, who then proceeds to reel off numbers to indicate just how precious they are. "To get those 60 billion antiprotons, the accelerator uses about 13 megawatt-hours of energy and requires the attention of some 20 staff members." The cost per pound would come to many million trillion dollars, Orr estimates, but so far all the antimatter made by all the laboratories in the world would amount to less than a grain of sand—in fact, about one-millionth of a grain of sand (which is still as many as 600 trillion antiprotons).

Antimatter may be exotic, but doctors use it all the time. Radioactive atoms are continually breaking apart into lighter atoms. In the process they emit radiation and particles, including positrons. Practitioners of nuclear medi-

For every billion ordinary particles annihilating with antimatter in the early Universe, one extra was left "standing."

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A positive print and its negative make a good analogy for ordinary matter and its opposite number.

cine can take water made from a radioactive version of oxygen and inject it into a patient's bloodstream. When positrons emitted by the radioactive oxygen hit electrons in the patient's body, they annihilate each other, producing two gamma rays in the process. In the brain, the most gamma rays will come from the areas that are busiest and attracting the heaviest blood flow. The scans can show doctors which parts of the brain are involved in which activities. The whole process is called positron emission tomography, or PET.

In principle, humans could someday discover how to use antimatter as rocket fuel. A speck of antimatter weighing one milligram (1/28,350 of an ounce) would, in combination with a speck of matter the same size, deliver more energy than two tons of rocket fuel. However, even if we produced antiprotons at five times the current rate (Fermilab's goal in the next five years)—and were able to store them—it would still take 200,000 years to create that one milligram of antimatter.

Stored antiprotons were the key to the first creations of antiatoms. Physicists at the European Center for Nuclear Research (CERN) produced nine antihydrogen atoms in late 1995. Shortly thereafter, Fermilab was able to create them as well. Antiatoms are made when positrons go into orbit around nuclei made of antiprotons and antineutrons, just as ordinary atoms are made of electrons in orbit around nuclei made of protons and neutrons. In the case of antihydrogen, a single positron has gone into orbit around a single antiproton.

To see what an antiatom experiment looks like, I went to Fermilab to talk to David Christian, staff scientist and spokesman for the antihydrogen experiment there. A tall, soft-spoken man, Christian began by pointing out that the production of antiatoms was really a pretty small operation. In a field where it is not unusual to have more than a hundred collaborators working on a single experiment, there were only seven involved in this one, from Fermilab and the University of California at Irvine. The main working parts of the apparatus actually fit on a largish tabletop down in the experimental area.

THE BASIC IDEA IS SIMPLE. WHILE THE ANTIPROTONS are circulating in the storage ring, a tiny jet of ordinary hydrogen gas is squirted across their path. Occasionally, an antiproton brushes by an ordinary atom, making an electron-positron pair in the process. Even more occasionally, the positron is moving fast enough to keep up with the antiproton, and the two stay together long enough for electrical forces to bind them together into an atom. This atom then comes out of the ring along with other things made in the collision.

To detect the occasional antiatom, the stuff coming out of the ring is run through a thin foil to separate the antiproton and the positron. A magnet then sends each of the particles into different sets of detectors, and it's only if the experimenters are confident that they've seen both that they label it as an "event." In the course of a year of intermittent running, the group saw 70 events—about one per day of running time.

It's hard to keep from getting bored waiting for the daily count to show up, so the group set up an automated monitoring system. Whenever something happened, the computer would dial Christian's pager with a message. Some sample messages: "We've lost the beam" ("That's a bad one," says Christian); "We have an event"; and "Nothing's happened for a while. Is something wrong?"

No, actually. We seem to be doing all right.

James Trefil professes physics at George Mason University in Virginia. This is the first SMITHSONIAN *appearance for illustrator Jeff Moores, of Honeoye in western New York.*

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MASTER ARTISAN RENÉ LALIQUE FASHIONED LYRICAL DESIGNS drawn equally from dream and from nature. Clockwise from left: One of the magical pieces displayed at the 1900 Paris Exposition, the *Insect Women and Black Swans* necklace is a tour de force of Art Nouveau design; unsettlingly realistic, diamond-winged wasps light on the iridescent opal in a gold-and-enamel hatpin; the ribbed *Dentelé* vase was created in 1912; an artificial ivory relief of dancing nymphs adorns this delicate gold-and-enamel pendant.

AT THE PARIS EXPOSITION UNIVERSELLE OF 1900, throngs of curious visitors lined up to see an unprecedented and eccentric display of extraordinary jewels. With its decorative grille of bronze "butterfly women" and its canopy of hovering black velvet bats, the showcase and its inspired array of strange and innovative jewelry created an immediate sensation. A corsage ornament took the form of a tangle of writhing, green-enamel serpents; a wide choker depicted a forest in winter, complete with diamond snow and a mother-of-pearl lake. The exhibit and its daring designs were the work of artist-jeweler René Lalique, who had turned his back on tradition and the prevailing idea of jewelry as a measure of wealth and status to forge an intensely personal style. Striving, in his own words, "to create something that has never been seen before," the artist employed wit, imagination, technical ingenuity and novel materials (glass, horn, enamel, plastic) to produce objects of unsurpassed beauty. His pantheistic repertoire of forms included a bestiary of fanciful creatures and a stunning sweep of flora and fauna—pomegranates, peacocks, pansies, sea horses, dragonflies, even mice. Recognized as the most important maker of art jewelry in fin-de-siècle Europe, Lalique went on to revolutionize the field of glassmaking.

An opulent exhibition, on view at the Smithsonian's International Gallery through August 16, reveals the richness and complexity of Lalique's jewelry design and places it in the context of his glasswork and decorative objects. Organized by Exhibitions International, "The Jewels of Lalique" focuses on the period (1889-1909) during which Lalique brought the sinuous style of Art Nouveau into the realm of wearable design, and makes it clear why his name has become synonymous with elegance, artistry, craftsmanship and innovation. —*Diane M. Bolz*

Lalique

LALIQUE INCORPORATED ELEMENTS OF CLASSICAL AND JAPANESE ART and the mysterious imagery of the Symbolists in his work. Clockwise from far left: Pine boughs frame a woman's face in a novel brooch featuring engraved stone; an elegant comb of carved horn captures the grace of swallows in flight; diamond blossoms overlay enamel flute players in an elegiac dog collar plaque; *Thistles* necklace combines glass and precious stones in an artful arabesque; a chalice with grapevine design boasts bacchanalian revelers; the fern-motif perfume bottle was designed in 1912; swarming bats symbolize night in this chased gold and enamel watch.

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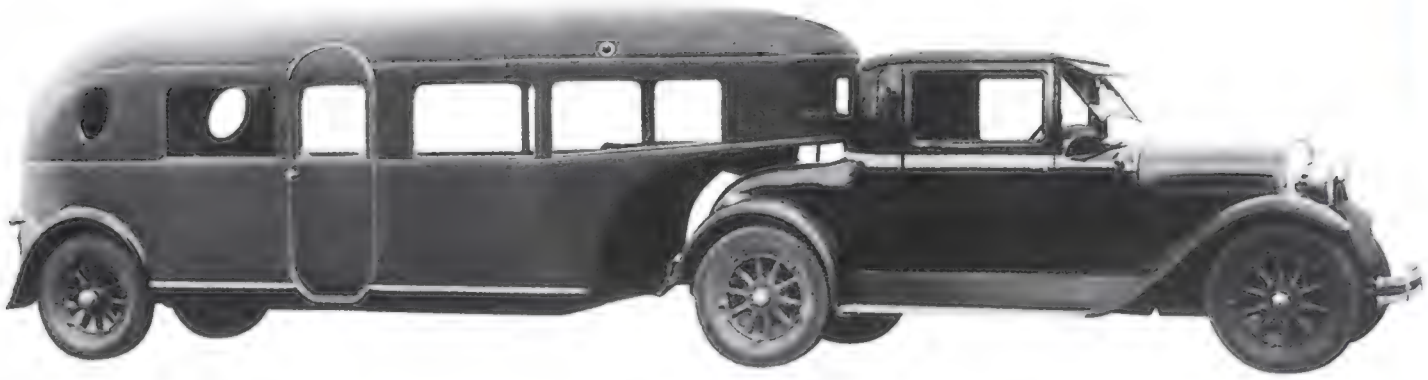


House Trailers

BY CHIORI SANTIAGO

"FLORIDA," THE WOMAN TOLD ME, gripping a shuffleboard cue, "is God's waiting room." She meant, it's a great place to retire. I followed her gaze around the shuffleboard court, newly resurfaced and ready for the first tournament of the season. I took in the nearby recreation building, painted flamingo pink, and heard the sounds of splashing from the pool. Above, the wide blue sky was plastered with clouds as fluffy as whipped cream on a slice of key lime pie. I nodded, but kept my next thought to myself: that in Bradenton, Florida, God's waiting room is likely to be a trailer park.

Trailer Estates, as this particular rest stop on the road to heaven is called, was the first mobile-home subdivision in the United States. Back in the 1960s, some of the 1,300 households living here thought the name had a disreputable ring—"manufactured housing" is the preferred euphemism these days—and tried unsuccessfully to talk their neighbors into changing it. Trailer Estates it remained, an unabashed reminder of the days when a house could, quite properly, be towed behind an automobile.

The first eight-foot-wide mobile home rolled onto one of these lots in 1955. Trailer Estates wasn't a seniors community then; there were some 30 families in the Children's Section and plenty of younger couples who spent weekends partying at Vincent's Tavern just up the street. The "park" was little more than an expanse of sand, scrub pine and palmettos in those days; there were no supermarkets nearby, and the only drinking water was the bottled variety. The original residents were an intrepid bunch of people who shared, along with a yen for inexpensive housing, a sense of adventure.

Although mobile homes don't really move at all, they often house people who are in transition: between poverty and a better job, between a steady paycheck and Social Security, between a cheap place to live and a more ex-

In the old days, designs like the Curtiss Aerocar (above) resembled horse trailers, but today's mobile home, like this model in Soledad, California (right), is basically a house.

PHOTOGRAPHS BY MAGGIE STEBER

Come a Long Way, Baby

pensive conventional home. Sometimes, the occupants are simply looking for a convenient hangout between seasons. Once, Trailer Estates went out of its way to emphasize that transitory attitude. Additions and "roof-overs," intended to make the narrow trailers look more like conventional homes, were frowned upon; the park was supposed to look as if it were permanently on vacation, a fleet of vehicles ready to hit the road.

The mobile home's antecedents, after all, were actual trailers, designed for recreational jaunts. Seasonal and itinerant workers adopted them as temporary homes in the

An elegant couple trips the light fantastic on the dance floor at Trailer Estates, a mobile-home subdivision in Florida.

1930s; during World War II, travel trailers became housing for instant communities of shipbuilders, munitions workers and hundreds of others mustered at factories around the country. After the war, and especially in the 1960s, when mobile homes grew bigger and roomier, a split occurred in the mobile home's family tree.

One branch of the family stayed nomadic and evolved into the RVs you see today, some so huge they reverse the natural order of things, towing the family car rather than being towed by it. The other branch settled down and tried to look respectable. These trailers put on weight: manufacturers widened mobile-home bodies to 10 feet, then 12; then double-wides and triple-wides came along, expanding the trailer's once-skinny silhouette to something the size of a small house. They accessorized, too, adding pop-up ceilings, split levels and bay windows. For a long time, mobile-home makers couldn't decide between a devil-may-care image and a domestic one; design details suggested both streamlined trailer and snug cottage, concepts that played off each other "in a kind of gigantic game of Mr. Potato Head," writes Allan D. Wallis in *Wheel Estate*, a history of the mobile home. In modern mobile-home design, the cottage won. Many of today's models are practically indistinguishable from "site-built" homes, and the only time they're mobile is when a semi-truck hauls them from the factory or sales lot to the land.

Stroll around Trailer Estates and you get an idea of what Wallis is talking about. You find everything from silver-sided eight-wides to grand, gabled facades, all trying to appear as homey as possible. No one complains about attached cabanas and roof-overs anymore. As the park aged along with its residents, it gradually took on a more sedentary personality, and now it has the cozy appearance of a very small town

I discovered just how small it is when I spent some time there recently. I'm a privacy-oriented city person. I'm not used to living where people's identities are on display, where rustic wooden signs tell every passerby which home belongs to "Walter and Edith" or "The Wilsons." At Trailer Estates, personalities literally spilled into the street: I could tell who collected teddy bears or plaster elephants or birdhouses just by glancing at the front yards.

Anonymity is impossible, anyway, thanks to the park's ever-alert grapevine. Before I met my neighbors, they knew all about me. "Yes, you're the gal who's renting Butch and Dottie's place," each new acquaintance would say, shaking hands. "You're driving the little red car and you were down in Sarasota the other day. Pleased to meet ya." My neighbor across the street, Jean Fish, noticed my comings and goings and would pop out of her door at the same moment I'd open mine, inviting me to sample her famous wheat cookies. One afternoon, as we putt-putted down Iowa Street in her golf cart, Jean waved at houses that looked shuttered and deserted. "Just because you can't see anyone doesn't mean they aren't there," she explained. "And if they are there, and they're looking out the window, they'll wonder why I didn't wave hello."

Funny thing is, by the end of a couple of weeks it all made sense to me. Living in Trailer Estates was a detour off the main road into a pocket of the world with its own

Trailer parks appeal to retired folks not least of all because they offer so many recreational opportunities. At Trailer Estates, these include biking (top), entertaining (above) and exercising.

rules and rhythms and expectations. There, I did things I haven't done since I was a Girl Scout. I went with Jean to Share-a-Craft, where we made toy soldiers for the Christmas sale and lunched on a molded "pâté" of corned beef, mayonnaise and lemon Jell-O. I lost at bingo and won at cards. In the evenings, I went pedaling on a three-wheeler with Freda Guy, 85, who had artificial kneecaps and rode as if she were taming a wild horse. Living in that trailer park was a lot like summer camp, and nothing as I expected.

We are led to expect the worst when it comes to trailer parks. They have an image problem. The very phrase "trailer park" is an automatic put-down. It contains a whiff of the marginalized, the impoverished, the suspect. Political consultant James Carville had only to say "trailer park trash" in conjunction with the name "Paula Jones" to convey his low opinion of the President's accuser. *New York Times* columnist Maureen Dowd, writing of the fine art of the insult, cited an invective by radio personality Don

At Tahitian Terrace, an oceanfront community near Santa Monica, California (top), artist Cheryl Kline works on a painting in her luxurious mobile home while her poodle Max kibitzes.

Imus, who proclaimed a Southern caller "a goober-faced, trailer-park nitwit." The very week I set out on a cross-country journey into the land of mobile living, *Newsweek* ran this comment from a TV talk-show host: "We will have responsible people talking about responsible things in responsible ways. We're looking for people with all of their teeth. Not people from trailer parks."

Once you've spent some time in trailer parks, you can appreciate how much such put-downs reveal about the ignorance of those who make them. The folks I met were lively, interesting and admirable, including some who are among the nation's lowest wage earners. My first stop was Soledad, California, where I introduced myself to Jesus Salazar, manager of Cooperativa Santa Elena, a tidy mobile-home community owned and operated by farm-workers, most of them from Mexico.

Salazar had perfectly sound teeth and an impressive handlebar mustache. I found him skimming the pool with a member of the board of trustees on the spot where, 20 years earlier, there'd been nothing but a muddy lagoon. "In the '70s, this park was owned by a man who treated us badly," Salazar explained to me in Spanish. "Every year he raised the rent. If people couldn't pay, they were thrown out. The electricity was dangerous, the roofs leaked, there were a lot of violations."

With help from legal-aid agencies and the National Co-operative Bank, a privately held institution that supports low-income housing, renters formed an association, got a loan and bought the park in the late '70s. Now a hundred families each pay $150 rent a month to live in this pleasant village where the mud has been replaced by paved streets. Bougainvillea twines up the sides of lattice-covered mobiles; at night, kids race bikes and teenagers kiss in the glow of streetlights.

"This is the only trailer park in the country that's owned and operated by campesinos," Salazar told me. "People couldn't believe we could do this. They thought we were crazy. But our kids are content here, it's safe and private. No one robs or bothers you. I wouldn't want to live in a

big house and pay $1,000 in rent. I want to die right here."

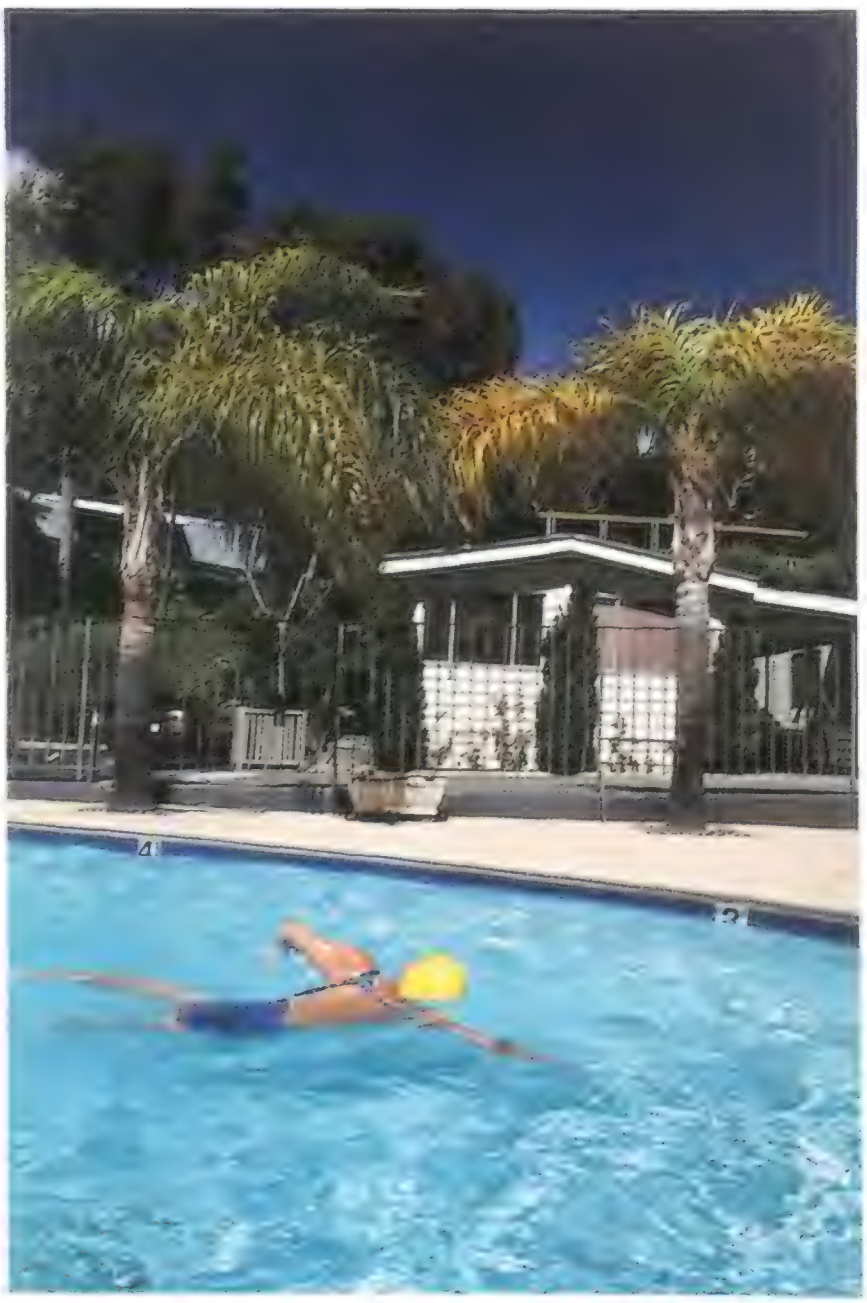
Down the coast in Pacific Palisades, I found Hollywood screenwriters, bankers and artists who pay more than $1,000 in rent for their version of paradise in a "luxurious mobile home community" tucked into prime real estate near Santa Monica. As I stepped into one artist's home, I had the illusion of stepping through Alice's looking glass into a decorator's dream. The place was a box on the outside, but when the screen door banged behind me I found hardwood floors, bright plastered walls and a hand-painted reproduction of Van Gogh's bedroom at Arles on the sliding doors of the bedroom closet. In back, a tropical garden climbed up the steep cliffside. "We pay a premium for the location, but this is a lifestyle choice," said another painter, Cheryl Kline, as we nursed margaritas and watched the sun go glimmering into the ocean. "You tell people you live in a mobile home and they never imagine something like this."

The history of mobile homes begins with the advent of good paved highways, which touched off a national motoring craze in the period between world wars. For the first time, Americans had the leisure time, the machinery and the all-weather roads they needed to tour the country. They were encouraged by such visionaries as Glenn Curtiss, who set out to travel in the most homelike environment he could build. He created a lavish "motor bungalow" as early as 1919. In 1928, he revamped his design and called it the Aerocar. It looked, on the outside, like a fancy horse trailer. It featured four berths, a galley, running water and an "observatory cockpit with a glass roof," according to *Wheel Estate*, and cost a whopping $2,500. A more proletarian option, at only $395, was the Covered Wagon. A Minnesota bacteriologist named Arthur Sherman designed and began mass-producing this trailer, which was compartmentalized like a dollhouse, in 1929, after a nightmarish family vacation during which he spent an hour wrestling with an uncooperative tent trailer in pouring rain. Made of plywood, the Covered Wagon appeared boxy, but the interior was comfortable and plushly appointed. Sherman started the business in his garage and by 1936 had become the largest manufacturer in the travel-trailer industry.

By then, autocampers were a familiar sight on highways and back roads. Many folks hauled contraptions of their own design. Some were little more than carts with bedframes that folded out at campsites. Others were canvas-and-wood boxes similar to today's tent trailers. Thousands of Northerners, carrying canned provisions, descended on the balmy South. Locals marveled and dubbed them "Tin Can Tourists." But by 1936 cities were enacting ordinances to limit parks, constrict the length of time that travelers could stay in them and charge fees that would encourage transients to keep moving.

Many people already had ample incentives to keep moving. Once the Depression got under way, laborers, from Dust Bowl migrants to skilled journeymen, were gypsying all over the country in search of work. They needed inexpensive housing that could be taken from one state to the next, if necessary. The camping trailer was the answer: you could move it, you could live in it.

Places like Shady Dell in Bisbee, Arizona, played an important role in the evolution of the trailer from a cart to a mobile home. Opened in 1927 as Dan Thompson's Motor Court, it's the only continuously operated trailer park in the state, and possibly the country, according to Ed Smith, who runs Shady Dell today with his partner, Rita Personett. Over the years, every sort of motor-camper stopped here. "For a small fee, probably a dollar, you could get a one-room cabin with a cot and an electric lightbulb,"



A resident enjoys the community pool at Tahitian Terrace, where Hollywood writers and artists pay $1,000-plus a month in rent.

In Cooperativa Santa Elena, a mobile-home park owned by farmworkers in Soledad, California, life is good on Monterey Lane.

Smith tells me when I stop by one day. "For a little more, you could pull in and park your car and trailer. For a quarter, you could put your tent down." He points out the remains of concrete pads marking ancient trailer sites.

Smith rents out half the space in his tiny park to visiting RVs, but it's the other half that has lured me here. Shady Dell is where Smith and Personett keep their remarkable collection of antique travel trailers. All built before 1957, they sit in streamlined splendor, like a row of aluminum-clad sausages, near the town cemetery and Dot's, a restored 1950s-era diner that's one of Rita's passions. "We bought the first trailer three years ago just because we liked the way it looked," says Smith, who in his snappy white Panama hat, two-tone shoes and pleated pants looks as if he's stepped out of the past himself. He glances over at a lovely 1949 Airstream (p. 85). "I've been in the collectibles and antiques business all my life. That's how this started."

After he and Personett acquired three of the old trailers on their travels around the country, they bought Shady Dell to park them in. They meticulously restored each unit and outfitted them with period furnishings, down to the chenille bedspreads and Melmac dinnerware in the tiny cabinets. Then they started renting them overnight to travelers. As Smith is explaining all this to me, I realize that Shady Dell must be as fascinating for trailer historians as the National Museum of Natural History is for dinosaur buffs.

One of Smith's collectibles is a kind of *Australopithecus* of trailers. "The 1946 Spartan is one of the models that evolved into the mobile home," he explains. "It was incredibly expensive for the time—$4,500—but it was ready to live in, although you were dependent on being in a trailer park. Everything is electric, so you have to plug in. It was also an all-weather trailer, equipped with a heater and not limited to summer use. These very quickly became what's known as the 'park model.'"

That night, cozy in an Airstream trailer that I can span in three steps, I pan-broil a steak on a miniature propane stove, listen to rain patter on the metal skin of my "ham can" home and agree with Dr. W. W. Baur, who insisted in a 1937 issue of *Trailer Travel* magazine: "Occasionally, the trailer may be the instrument of recovery from impending nervous disease of severe character."

A few days later, in Vidor, Texas, I stop in at Golden West Homes, one of several manufactured-home lots strung along Interstate 10, and check out the newest models. "This is no trailer," says general manager Bob Butler as he unlocks the front door of a triple-wide Schult Grand

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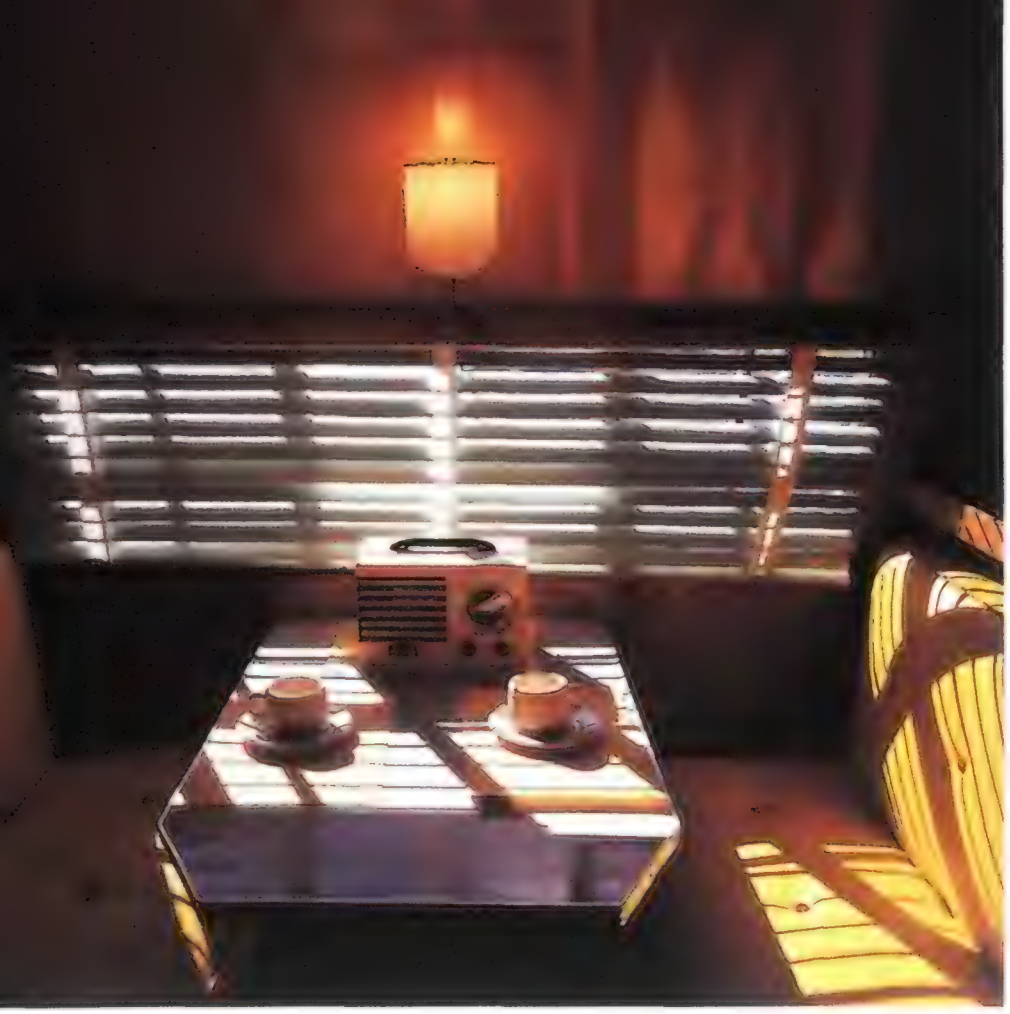

Appointments in trailers at Shady Dell in Bisbee, Arizona, include a 1950s kitchenette (left) and a classic Airstream bedroom.

Isle Model. Four bedrooms, den, two baths, all smelling faintly of new synthetic pile and no-wax linoleum—it's a far cry from the modest campers Schult began building back in 1934. "Look at this." Butler emphatically pounds a kitchen cabinet with his fist. "That's solid wood. No particleboard here."

Mobile homes like this run about $35 a square foot, compared with $65 for the average site-built house, Butler says. He'll sell you a Grand Isle for $70,000. "This unlocks the door to home ownership for a lot of people. But, yes, we do have an image problem to overcome." He runs a hand over his head and grins. "I'll tell you a Texas joke: 'Trailer homes attract tornadoes.' They don't. They really don't."

Maybe they don't, but many mobile homes have been damaged by tornadoes and other storms over the years. According to the National Weather Service, only about 10 percent of the country's population lives in trailer parks, but half of those killed by tornadoes each year are trailer-park residents. One reason mobile homes are vulnerable to damage has to do with their location on marginal land subject to floods and wind damage. Another has to do with their lightweight and often flimsy construction. The good news is that the mobile-home industry is now making a stronger product with wood framing like that in conventional homes, fire walls, stabilizing plates and steel tie-downs.

When I reach Bradenton, Florida, real estate agents Butch and Dottie Roberts show me around the two-bedroom, double-wide mobile home I'll be renting for the next few weeks. It's nothing like the claustrophobic 28-footer Lucille Ball and Desi Arnaz tried to drive across the country in the 1954 MGM comedy *The Long, Long Trailer*. This place is roomier than most of the apartments I've had. I unpack as the evening news announces storm warnings here and reports on floods in other parts of the county, but I can't even hear the raindrops on my sturdy roof.

Although it's part of the city of Bradenton, Trailer Estates functions almost as a city unto itself. It has its own post office, a marina, a fire department and a church. Not until 1993, when the residents voted to restrict ownership to those over age 55, did it cease to be multigenerational. A few families with kids, grandfathered in, linger.

One morning, I climb into the cab of Pat Wilcox's truck as he makes the rounds. A park resident, Wilcox is too young, at 58, to melt into quiet retirement, so he keeps busy as a resident handyman. He's also a park trustee, a volunteer firefighter and fleet captain for the yacht club. He embodies the restless spirit that characterizes many of those drawn to mobile-home living. Roughly two-thirds of Trailer Estates' people are snowbirds who summer in homes up North and return to Bradenton in the fall.

Wilcox takes me to the firehouse. The fire auxiliary has held enough barbecues and rummage sales to make the last payments on a shiny $186,000 emergency response truck. "We had an old ambulance-hearse that looked like the circus came to town," firefighter Butch Cottom tells me. "We'd pull up at an emergency scene and all these people would come piling out."

I watch the new equipment in action just a couple of days later, when the worst thing that can happen in a mobile-home park does happen. A leaking propane tank touches off an explosive fire in a home on Bay Drive. Thick smoke boils into the sky. Flames leap toward nearby homes. "The one problem with these things is, they're tinderboxes," says a firefighter. In ten minutes, the old sin-

gle-wide is a charred shell, its siding peeled and slumping. The owner is lucky. Although hurt, she walks away from the conflagration, and firefighters manage to save her car.

It's a close call for the neighbors, too, but no one seems too concerned. My own neighbors go off to their art classes or go shopping in town. "Don't worry," they tell me, "you've got electric, not gas." I attribute their nonchalance to Midwestern stoicism.

A home here isn't a status symbol, it's a rest stop between adventures. Midge and Clay Cochran sold their 17-room house in Brazil, Indiana, to move here. Midge worried because, at 80, Clay insisted on climbing on the roof to make repairs. She can keep him off the top of their mobile home—but she can't slow him down. Now that she's 85 and he's 90, they're hardly ever home. They volunteer for meals-on-wheels, delivering lunch to "older folks." Age, I am happy to learn, is such a relative state; no matter how old you get, you always feel younger than someone else. One day we pile into the car with the Cochrans' good friends John and Kathryn Howard and head off for the consignment shops in Sarasota. "Blast it out, honey!" Midge says. Clay cranks up the AC and barrels on down Highway 41.

In one of the shops we visit, I find myself wondering if the wealthy vacationers over on nearby St. Armand's Key could appreciate the particular triumph we share when Clay snags a pair of almost-new slacks for a buck. They're a shade of salmon color that would discourage many a man with less nerve. I myself shell out $4 for a pair of spike heels tooled like a cowboy's prized saddle. I feel rich.

On Friday we head to Holmes Beach for a Trailer Estates ritual: watching the sun set over the Gulf of Mexico. A couple dozen of us monopolize the picnic tables, sharing fish sandwiches and pasta salad. We set our beach chairs in a long row on the sand. The sky glows like a stained-glass window. At the moment the blazing globe meets the horizon, we raise our hands and cheer. "Look at that color," someone murmurs, referring to the whorled lavender sky. I feel even richer.

On Ladies' Night at the Loveland Ballroom, a short drive from Trailer Estates, Pat Wilcox's wife, Sharon, and I pay our two bucks each at the door and take our places for a lesson in country line dancing. Cowboy music twangs and we shuffle step, grapevine back, click our heels and sashay. Country line dancing is different from square dancing. You have to learn certain patterns but you don't have a partner; you're on your own. It doesn't take me long to understand why it's all the rage at Trailer Estates. It expresses a mobile-homer's sensibility. Each of us has a responsibility to the whole. At the same time, we're independent, we're allowed our quirks and personal twitches; we don't have to interact unless we choose.

I understand, too, why most people wanted to keep the name Trailer Estates, back in the 1960s. Mobile homes may exist on the periphery of society's vision, they may be the butt of jokes, but they typify the way America likes to dream of itself. They offer the promise of suburbia for those who can't afford to move from the city, the luxury of a resort for folks on a Levittown budget. Ordered in neighborly units, in happy homogeneity, they are pioneer wagons circled against danger, and yet they encourage our desire to thrust forward into the unknown. They're attitude as much as architecture, an attitude I find more alluring the longer I stay. Damn the tornadoes. Hitch me up!

Writer Chiori Santiago already misses the charms of mobile-home living. Maggie Steber has worked as a documentary photographer since 1978. Her latest book is Dancing on Fire: Photographs from Haiti

A vintage trailer from the 1940s, part of a collection at Shady Dell, houses overnight guests in cozy "ham can" splendor.

In *Mujer ángel (Angel woman)*, 1979, a Seri Indian woman walks into the Sonoran Desert, boom box in hand. The luminosity and cinematic composition of the photograph transform the ordinary into the surreal.

Images of the Spirit

The Evocative Vision of Graciela Iturbide

THE MEXICAN PHOTOGRAPHER BLENDS HISTORY, LYRICISM AND PORTRAITURE TO RECORD CULTURES IN TRANSITION

BY JONATHAN KANDELL

LOOKING BACK OVER MORE THAN 20 solo exhibitions and eight books of photographs, the acclaimed Mexican photographer Graciela Iturbide can still pinpoint the breakthrough moment in her quarter-century-old career. It happened in 1979 when Francisco Toledo, arguably Mexico's best living painter, asked her to do a series of photographs of his hometown, Juchitán, in the state of Oaxaca.

The outcome was the photo-essay titled *Juchitán of the Women*, which focused on the matriarchal nature of this Zapotec Indian community. Women appear as healers, as political leaders, as merchants, as sexual sirens. The most memorable male in the series is a transvestite.

Toledo often found inspiration for his own work in Juchitán. But his paintings never allude to what has now become recognized, thanks to Iturbide's photographs, as the social nexus of his hometown—a power held by women in the society that is unusual in Mexico. "I didn't deliberately seek the subject," says Iturbide. "When I got to Juchitán, the women adopted me." They brought her into their homes, invited her along to the market and let her witness their religious ceremonies, which interweave Catholic and pre-Hispanic rites. "The fact that I'm a woman helped give me access," says Iturbide, whose large, expressive eyes are her most prominent facial feature. "But it wouldn't have come about without Toledo's invitation."

Toledo was delighted by Iturbide's vision, and arranged for her photo-essay to be shown in both Juchitán and Mexico City in 1980—Iturbide's first solo exhibitions. Later he published the work as a book. Some of these photographs will be on display as part of a large Iturbide retrospective organized by the Philadelphia Museum of Art. The exhibition, titled "Images of the Spirit: Photographs of Graciela Iturbide," will be in Philadelphia from June 14 through August 9 and will then travel to five cities across the country. A handsome book has been published by Aperture to complement the show.

The 56-year-old Iturbide has always handled well the potentially edgy relationship between mentor and protégé. She learned her craft from

It's all in the hands. Above: In *Juego de manos (Hand play)*, 1988, from Iturbide's series on Juchitán, disembodied hands reach out to a child whose fingers bear menacing extensions. Opposite: *Rosario, Cristina, and Liza*, 1986, is from a series on East L.A. gangs.

Manuel Alvarez Bravo, still (at the age of 56) Mexico's master photographer. After marrying and having three children, Iturbide enrolled at the National Autonomous University of Mexico in 1969 with the intention of becoming a film director. But a course in still photography with Alvarez Bravo convinced her to abandon cinematography. He, in turn, was impressed enough by Iturbide's photographs to invite her to work as his assistant.

Iturbide soon found that her approach to photography differed sharply from Alvarez Bravo's, and the apprenticeship ended after 18 months. "He's like a poet," she says. "He favors vignettes, single photos. I realized early on that I preferred photo-essays." But the two have remained close. Iturbide says she moved into her present house in the village-like Coyoacán district of Mexico City because Alvarez Bravo lives only a

Each September in the Mexican town of Chalma, a carnivalesque fiesta is held on the day dedicated to the archangel Michael. Children and adults don masks and costumes and take part in an intriguing mix of modern and pre-Hispanic ritual. Top: *Primera comunión (First communion).* Bottom: *Angelito mexicano (Mexican cherub).*

few blocks away. "What I learned from him was the joy at discovering my country," says Iturbide. "My family was bourgeois, conservative, deeply Catholic. I was sent to a nuns' school. It wasn't a social environment that encouraged a great admiration for our national reality. It emphasized Hispanic over Indian culture."

Over the past century, the leading Mexican artists and writers have tried to do just the reverse: to rip away their country's Hispanic mask and expose its underlying Indian reality. In many of her photographs, Iturbide clearly identifies with this tradition, and stakes her claim as part of a cultural continuum that includes artists such as José Guadalupe Posada, Diego Rivera, Frida Kahlo, Rufino Tamayo, Toledo and Alvarez Bravo.

But what lends originality to her work and gives it a universal appeal is her conviction that traditional societies are strong enough to withstand the intrusion of the modern world. In Iturbide's images, Indian culture survives, adapts and constantly evolves. She has no patience with nostalgia. "I don't agree with photographers or anthropologists who want life to stand still, and attempt to portray Indians living the same way they have for centuries," says Iturbide, whose soft voice contrasts with the firmness of her views.

Her own unsentimental approach is illustrated by the photograph titled *Angel woman*, which shows a Seri Indian, in traditional formal costume, making her way down a hill into the Sonoran Desert. With her left hand, she balances against a rock; in her right, she grasps a large boom box.

More complex examples of the syncretism of old and new cultural influences appear in Iturbide's series on Chalma, a religious site just southwest of Mexico City. In the Aztec era, Chalma was home to the deity of prostitutes and thieves. After the Spanish Conquest, an Indian claimed to have seen a dark-skinned Christ appear at the site of the former Aztec altar. For the past four centuries, pilgrims have flocked there to pray to the "Black Lord of Chalma," participating in rituals that intermingle pre-Hispanic, Christian and contemporary secular elements.

In Iturbide's Chalma photographs, penitents wear Spanish communion or wedding dresses with Aztec skull masks over their faces (top left). In some cases, the masks portray current political or business figures who have become notorious. (One of the more easily identifiable masks caricatures former president Carlos Salinas de Gortari, driven into exile by financial and political scandals.)

Death is a recurring theme in Iturbide's work. "I think all Mexicans have an obsession with death, a desire to play with it, because it's so much a part of daily life," she explains. "It's present in every village's folklore, in popular songs, in the sugar-candy skulls that get handed out on the Day of the Dead." Death holds a particular poignancy for Iturbide because of the death of her own young daughter.

In her photo-essay chronicling the annual slaughter of goats in a Oaxaca highland Indian village, the artist's camera deftly underscores the pre-Hispanic and biblical elements in the death ritual. A young goat, garlanded with flowers before being butchered, recalls the human victims adorned for sacrifice in the pre-Conquest era. A woman with a knife clenched in her teeth, her face grimacing as she gets ready to gut an animal, looks like a female Abraham—evoking the Old Testament story of sacrifice.

"I don't pretend to make my photographs speak the truth of what Mexico is all about," says Iturbide. "But in its villages I can feel the way culture is changing, and it's fascinating to live through it and try to capture it on camera."

Jonathan Kandell is the author of La Capital: The Biography of Mexico City.

Top: The looming death imagery in *México, D.F. (Mexico City)*, 1972, enhances its hallucinatory effect. Above: *Nuestra Señora de las Iguanas (Our Lady of the Iguanas)* is also known as the "Juchitán Medusa." Left: Iturbide spotted the figure in *Carnaval (Carnival)*, 1974, along the highway.

Iturbide's photographs highlight the integration of pre-Hispanic, Catholic and contemporary ritual into Latin American daily life. Above: The conquistadors' Christian legacy is clear in *La tienda (The store)*, 1982, taken in Quito, Ecuador. Top right: *Carmen*, 1992, documents the annual slaughter of goats in Mixteca. Bottom right: *El gallo (The rooster)* is from the artist's Juchitán series.

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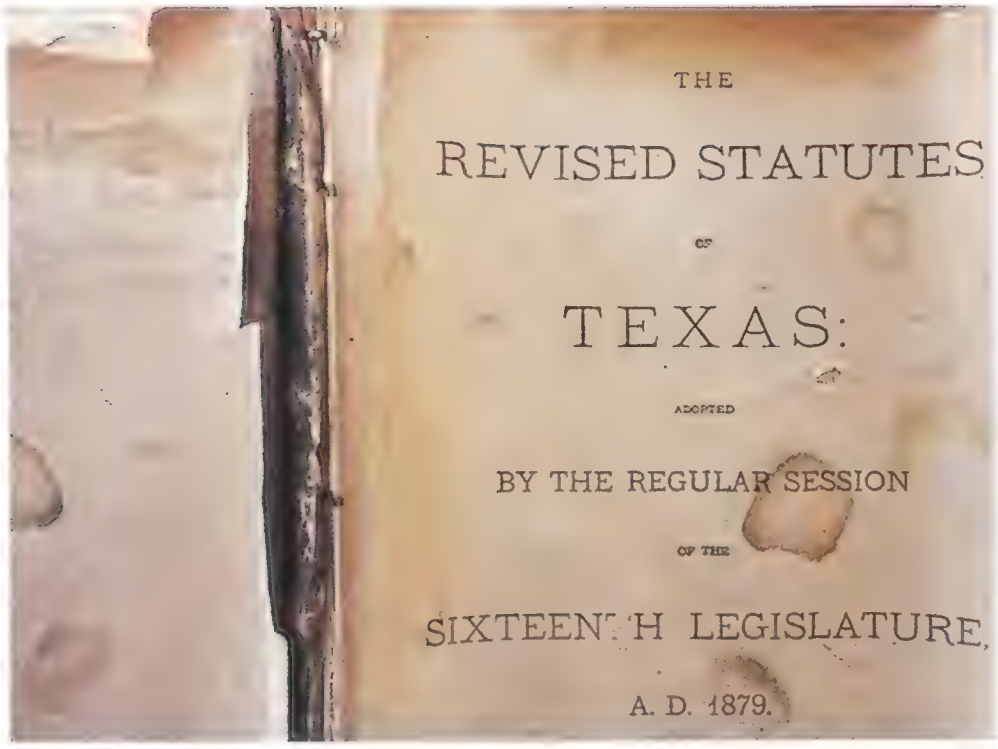
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'Hang 'em

JUDGE ROY BEAN NOTARY PUBLIC
JUSTICE OF THE PEACE. LAW WEST OF THE PECO
BILLIARD HALL

BY GOBS! THERE WAS NOTHING JUDICIOUS ABOUT JUDGE ROY BEAN

BY BRUCE WATSON

BEHIND THE BAR OF A RICKETY WOODEN SALOON IN a lonesome corner of the Old West stood a grizzled bear of a barkeep. His crooked neck was hidden by a beard. His soiled bandanna reeked of bourbon and sweat. No stranger to these parts would have suspected him a judge, but without warning he shouted, "Order, by Gobs! Order in this court!" Lumbering across the saloon, he took off his apron and donned a dirty alpaca coat. He seated himself behind the bar and drew his pistol. "Hear ye! Hear ye!" he proclaimed, banging the gun like a gavel. "This honorable court is now in session, and if any galoot wants a snort before we start, let him step up to the bar and name his pizen."

first, try 'em later"

Judge Roy Bean never attended law school, but he knew how to hold court. His saloon, scorched by the West Texas sun, served some of the finest hooch in the territory. It also had two poker tables, a beer-keg table holding the judge's only law book, and a porch hard by the Rio Grande. In this venue, the judge set many legal precedents. Take the case in which a corpse found near the Pecos River was brought back to Judge Bean's saloon. The dead man's pocket held $40 and a pistol. "I hereby fine this corpse $40 for carrying a concealed weapon," the judge declared, pocketing the money. At least, some say he did. Then there was the highfalutin lawyer who demanded Bean issue a writ of habeas corpus. The judge threatened to hang him for using foul language in his courtroom. According to legend. And some folks still talk about the San Antonio slicker who tried to appeal a fine. The judge listened carefully, then set his six-shooter on the bar. "There is no appeal from this court," he said. "And that's my rulin'." Appeal denied. So the story goes.

Many Wild West legends have been tamed by truth. Billy the Kid (SMITHSONIAN, February 1991) didn't kill 21 men—4 is more like it. Butch Cassidy and the Sundance Kid looked very little like Paul Newman and Robert Redford. But nearly a century after his death, Judge Roy Bean remains a blur of fiction and fact. Did he really sentence dozens to the gallows, saying "Hang 'em first, try 'em later"? Did he name his town and saloon after his true-love, a British actress he'd never met? Did he keep a pet bear in his courtroom? Rendering a verdict on most Bean legends, the jury remains, well . . . hung. Yet this much is certain: in a brutal landscape where the only other law was nature's own, Judge Roy Bean was, as he claimed to be, the "Law West of the Pecos."

In 1882, when the Galveston, Harrisburg and San Antonio Railroad reached Pecos County, it faced one mean stretch of Texas turf. To link San Antonio with El Paso, railroad crews had to cross 530 miles of sagebrush, leading, one wag said, "from no place through nothing to nowhere." The high, hilly desert was a cactus garden infested with bobcats, rattlers and scorpions, locally called vinegaroons. Summer temperatures topped 100 in the shade, if you could find any shade. Water was as scarce as a smiling face. Yet by the spring of that year, 3,000 men were cutting the railroad's course along the Rio Grande. Serving them whiskey from a tent was a leathery saloon keeper named Roy Bean.

Bean had taken the scenic route to West Texas. Almost nothing is known about his childhood, not even his birth date sometime in the mid-1830s. But at about 15, he left his hardscrabble Kentucky home to follow two older brothers westward toward adventure. For the next 30 years, he studied pre-law, Old West-style. With brother Sam, he joined a wagon train into New Mexico, then crossed the Rio Grande and set up a trading post in Chihuahua, Mexico. *Los Frijoles*, as the locals called the Beans, did business for a few months before going their separate ways at the Mexican border. That was after Roy had got into a bit of a dustup when an hombre died from one of his bullets. So he rode on alone across the Southwest and, in 1849,

Opposite: "The only law west of the Pecos," Judge Bean appears in a formal portrait and on his horse Bayo in front of a rebuilt version of the Jersey Lilly, which served as saloon, pool hall and courthouse. At top right is the only law book Bean ever consulted.

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He soon built a small saloon and hung a tattered picture of Miss Lillie behind the bar.

dropped in on brother Joshua, who would soon become the first mayor of a little pueblo called San Diego. There he began romancing his own image. He strutted the streets in a sombrero and embroidered pants, with two guns in his belt and a bowie knife in one boot. The darling of local senoritas, he developed a reputation for bragging, dueling, and gambling on cockfights. To tame his wild brother, Mayor Josh Bean made Roy a lieutenant in the state militia and bartender of the Headquarters, the mayor's own saloon. The taming worked for a while, but in 1852, Roy wounded a man in a duel. Arrested, he broke out of jail. A few months later, Josh was killed by his rival in a romantic triangle, and Roy rambled back to New Mexico where Sam Bean had become a sheriff.

Roy quietly tended bar in Sam's saloon for several years. When the Civil War broke out, he began running the Union blockade, bringing goods by wagon from the Mexican border into Texas. After the war, and pushing 40, he married a Mexican teenager and settled in San Antonio. Throughout the 1870s, while various parts of Texas exploded in range wars, Bean was a dishonest working man supporting five children. He peddled firewood (cut without permission on another man's land) and sold milk (watered down). Once when a customer found a minnow in his milk, Roy responded, "By Gobs, that's what I get for waterin' them cows down at the river." His notorious business schemes earned his San Antonio neighborhood the nickname "Beanville." But when his marriage began to fail, Roy resurrected his romance with the untamed West.

In the summer of 1882, the San Antonio *Express* published a brief notice from Eagle's Nest Springs, in Pecos County:

> I would announce to my friends and the public in general, that I have opened another saloon at the above place, where can be found the best of wines, liquors and cigars. . . . Visitors will always find a quiet, orderly place, where they can get a good drink.

Judge Bean's bar still looks much as it did when he used to shortchange customers and brag about his "acquaintance with Miss Langtry."

Today a refurbished Jersey Lilly draws 80,000 visitors a year from around the world, wherever the American West is romanticized.

. . . The water is good and the scenery grand. Will be pleased to see any of my friends at all times.—Roy Bean.

Vast stretches of range and sky separated the Pecos from Beanville. Bean, his beard now salted in gray, had crossed the barren country in a wagon loaded with whiskey barrels and tent canvas. At the edge of a railroad camp called Vinegaroon, he pitched his tent and began selling liquor to thirsty railroad workers. Business was good, but risky. "There is the worst lot of roughs, gamblers, robbers and pickpockets collected here I ever saw," a Texas Ranger lamented. An old Texas saying proclaimed "West of the Pecos there is no law; West of El Paso there is no God." In Vinegaroon, rangers could round up the usual suspects, but the nearest courtroom was a week's ride away. Some sort of law was needed, and—with three months of formal education to his credit—Roy Bean seemed to be the man. As his own best saloon customer, he was often drunk and disorderly. But Bean could talk circles around anyone who crossed him. And while a reasonable man wouldn't dare lay down the law to a bunch of railroad rowdies, Roy Bean was crazy enough to try it. "The camp is as quiet as can be," he'd say. "There hasn't been a man killed for four hours." When he came to the Pecos, he just wanted to be a saloon keeper. But on August 2, 1882, Pecos County Commissioners "ordered that Roy Bean be and is hereby appointed the Justice of the Peace for Precinct No. 6, Pecos County, Texas."

Bean packed up and moved north to a small settlement on a bluff above the Rio Grande. When he arrived, the town was a tent city, a ragtag cluster of dance halls and drinking establishments surrounded by sagebrush and solitude. Langtry was its name, in honor of a railroad boss who had run the Southern Pacific's tracks through it. But by coincidence, the name also belonged to a beautiful British actress Bean had read about in the newspaper. Captivated by Lillie Langtry, Bean began claiming he named the town for her. Like many of his boasts—that he had fought in the Mexican War, that he was related to Daniel Boone—this one was pure Texas bull. But he soon built a small saloon and hung a tattered picture of Miss Lillie behind the bar. She was known and billed as the "Jersey Lily," so he named his saloon after her—with an extra *l*, thanks to an orthographically challenged sign painter.

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Bean's "someday" friend was actress Lillie Langtry, the "Jersey Lily," also admired by Edward VII.

Above the door, he posted signs proclaiming "ICE COLD BEER" and "LAW WEST OF THE PECOS." From the capacious barroom, which doubled as his home, Bean began dispensing liquor and the law.

His lone law book was *The Revised Statutes of Texas, 1879*. "They send me a new book every year or so," he said, "but I use it to light fires with." He had two pistols, a muzzle-loading rifle and colossal nerve. He quickly became his own court jester, astounding criminals with his demeanor and decisions. "It is the judgment of this court that you are hereby tried and convicted of illegally and unlawfully committing certain grave offenses against the peace and dignity of the State of Texas, particularly in my bailiwick," a typical Bean ruling went. "I fine you two dollars; then get the hell out of here and never show yourself in this court again. That's my rulin'." If his justice was arbitrary, it was consistently arbitrary. Though he could swear in English or Spanish, Bean rarely tolerated cursing in his courtroom. Those using invective harsher than his "By Gobs!" were sometimes fined, often the exact amount Roy owed them in change at his bar. He roamed the Pecos region carrying blank warrants that he served at the slightest offense. Once he boarded the train to ride up line and fine two men for fighting. "You know," he told the conductor, "this court of mine has to be self-sustaining."

Unfettered by legalities, Roy Bean's justice was governed by greed, prejudice and a dash of common sense. If a marriage "didn't take," then Bean granted a divorce. Once, after divorcing two couples, he married each man to the other man's ex-wife, collecting two dollars for each divorce and five for each marriage. One day a railroad bridge in the Pecos River Canyon collapsed, and ten workers fell 300 feet to the canyon floor. The judge, who earned five dollars for each coroner's inquest, soon rode up on a mule. Three of the victims were still alive, but Bean pronounced all ten deceased, picking up an extra 15 dollars in the process. Of the injured he said, "Them three fellers is bound to die."

Despite such capers, Bean, once duly appointed, was duly elected in 1884. He was often reelected, so that between 1882 and 1902, most of the time Bean's peculiar rulings were the law. Given the circumstances, his law wasn't all that peculiar. Those quick to judge him should visit Langtry, where the Jersey Lilly still stands. From the saloon's steps, one can see a dozen dusty buildings. Beyond these lie nothing but barren land and cactus baking in the sun. The nearest jail is 50 miles away in Del Rio, and the nearest mercy meted out by nature is well beyond the horizon.

In legend, Judge Roy Bean is a merciless arbiter, but folks in Langtry

There stood a woman, regal, Titian-haired and as beautiful as her picture on the wall of the saloon.

like to tell a different story. Rancher Jack Skiles grew up in the town, whose population has petered out from 300 in Bean's heyday to about 20 nowadays. In 1963, Skiles began interviewing old-timers who remembered Bean from their childhoods. By 1968 he had become the first director of the Judge Roy Bean Visitor Center. "The term I always heard Langtry people use for Roy Bean was 'that old reprobate,'" Skiles told me over lunch in his house on a bluff above the Rio Grande. "Now, 'reprobate' is not the kind of word Langtry people used a lot." Thumbing through a dictionary, he read: "'*Reprobate*—depraved, corrupt, a scoundrel or mischievous rogue.' Well, I guess that's a pretty good word for old Roy."

But when compared with his contemporaries, "that old reprobate" was a solon of the Southwest. In most one-horse towns, justice was a one-man job. Familiarity with the law was optional. The phrase "sober as a judge" contains a wealth of irony since many Western judges were drunk as skunks, even in court. To enforce their authority, they used canes, fists, sometimes pistols. In the mining town of Sonora, California, justice Richard Barry once fined and jailed a lawyer for merely suggesting that the court had no authority. "I told him that I didn't care a damn for his book law, that I was the law myself," the honorable Barry said. The decision was a warning to "unrooly" persons not to contradict. And although Bean is often called "the hangin' judge," the West's hangingest judge was Isaac Parker of Fort Smith, Arkansas. Parker sentenced 172 men to hang and strung up 88 of them. Measured against these "suspended" sentences, Roy Bean's rule was even-handed, even wise.

Bean prevailed because he was the right man in the right place. "That man did a world of good," said an El Paso judge who had known Bean. "The rough community where he had settled would have tolerated no enforcement of the law as it was printed on the statute books. But they tolerated Bean, because he was both law and equity, right and justice." Geography was also on Bean's side. In more populous parts of Texas, violent factions waged war over sheep and cattle, but there wasn't much to fight over in Bean's territory. Except for the occasional murder, his cases consisted of misdemeanors, counts of drunkenness and the crimes of small-time con men like himself. Bean spent most of his days sitting on the porch of his saloon, with rifle handy. In his spare time, he served customers. His favorites were railroad passengers, desperate for something to drink while their train took on water. Bean served them quickly, then lingered giving them change. And lingered. When the train's warning whistle

With only 20 residents left in town, Langtry's Sample Cafe has fallen on hard times.

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lies in the size of the pigment particles.

Red Iron in Pottery

By Yoshiyuki Matsuo

Japanese culture has influenced Western culture in many ways for several hundred years. Take pottery, for example. One of these Japanese influences is a gold-tinged red color called *aka-e* of Sakaida Kakiemon made from an iron compound called ferric oxide (Fe_2O_3). The color exerted a strong influence on European pottery via pieces brought back by the Dutch in the 17th century.

The literal meaning of *aka-e* is "red painting." This vivid red, born out of trial and error, was dubbed Kakiemon red for the family that discovered it. The color caught the imagination of a young researcher who resolved to crack the riddle as to how this color was achieved. That was over 30 years ago, and the young researcher, Dr. Toshio Takada, is now a professor at the Okayama University of Science.

The difference between Kakiemon red and other reds lies essentially in the size of the type of ferric oxide particles. For red-ochre red, the particle diameter must be 650 angstroms. For Kakiemon red, 700 angstroms. While the difference is minute, the difference is vast when perceived by the human eye.

The technique for reproducing the distinctive red has been passed down in generations as a secret of the Kakiemon family, and includes the right clay to collect, the right way to strain it, and the right length of time to knead it in a mortar.

Dr. Takada's research was later used to produce a bright red in modern pottery, and has also been used in research on ceramics which are difficult materials to control. A difference as minute as one 100 millionth of 1cm has actually changed the world of every day objects. In microelectronics, as well as material science, the microscopic world can no longer be ignored.

[illegible] has been an editor for the Nihon Keizai [illegible] "Nikkei Science," the Japanese version of "Scientific American." His special interests in material science include [illegible] tals, C60, and superconductor.

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At the edge of nowhere and nothing, Bob Fitzsimmons fought Peter Maher for the world title.

blew, customers swore and demanded their money. The judge hereby fined them the exact amount and sent them cursing back to their coach.

Bean regularly boasted of his "acquaintance with Miss Langtry." Someday, he said, he hoped she would come to Langtry and sing. In 1896, after his first saloon burned, Bean rebuilt the Jersey Lilly and then put up a home for himself across the street. Miss Lillie would someday perform there, of course, so Bean called his home the Opera House. His dreams of Lillie were not as wild as they seemed. Langtry, whose beauty partly inspired Oscar Wilde to write *Lady Windermere's Fan*, sometimes toured Western theaters. In 1888, she performed in San Antonio. When Bean learned of the upcoming show, he dressed up, took the train to the big city and bought a front-row seat. He had hoped to meet her backstage but at the last minute was struck by a rare fit of shyness. He never met Miss Lillie, but back home he celebrated his sighting for a week. He continued to yearn and often wrote her. Once she wrote back and even offered to give her eponymous town an ornamental drinking fountain. Bean replied that the fountain wouldn't be necessary because "if there's anything these hombres of Langtry don't drink, it's water." Yet Bean cherished two fancy pistols some say Miss Lillie sent him, and her picture was a fixture in the Jersey Lilly. Someday . . .

There were plenty of Judge Roy Bean stories in the Texas newspapers. But you can't believe everything you read in the papers. Did the judge once flag down millionaire Jay Gould's train, then sip champagne with the railroad tycoon in the Jersey Lilly? Unlikely. And what about Bean's bear, Bruno? Once, a story goes, a woman's little dog strayed too close to Bruno. The frantic woman begged the judge to free her precious pet from the bear's clutches. "Well, lady," Bean said, "if you buy your dog 50 cents' worth of meat at my market, I'll feed it to the bear and he'll forget about the pup." Photographs of Bruno exist, yet few old-timers would swear to this story under oath.

Of all the legends, none is more outrageous than Bean's ruling on the murder of a Chinese man. When it came to race, Bean's law was far from colorblind. He loved the free-spending Irish who frequented his bar, but had less regard for the more thrifty Chinese. When an Irishman killed a Chinese worker, friends of the accused said they'd tear down the Jersey Lilly if Bean found him guilty. The tale of what happened goes something like this. Searching for another legal precedent, Bean rapped his pistol. "Hear ye! Hear ye!" The court was in session. He then browsed through his law book, turning page after page. "Gentlemen," he said at length. "I find the law very explicit on murdering your fellow man, but there's nothing here about killing a Chinaman. Case dismissed." Unfortunately, this one is probably true.

Many of Bean's rulings were amusing, but there's nothing funny about getting away with murder. Or getting your son off for murder. Sam Bean was the youngest and wildest of Roy's five children. One day in the saloon, a certain Mr. George Upshaw made fun of Sam's fine Mexican blanket. The two men argued, and Upshaw slapped Sam in the face, drawing blood. Roy said simply, "Shoot him, Sam—shoot him." Obeying his father, Sam blew the man away. For the next year, Roy corralled witnesses and promised favors. In a Del Rio courtroom in 1899, Sam Bean was acquitted. The verdict, a Langtry old-timer remembered, cost Roy "many a bottle of beer" and nearly all the money he'd managed to save.

Bean kept no record of his cases. "I have got the cleanest docket in the state of Texas," he gloated; "not a scratch of a pen on it." But as his legend grew, he enjoyed bullying the tourists who came to see him at the Jersey Lilly. Nearly every Bean story has the smoky scent of a tale told round a campfire. Yet in his book *Judge Roy Bean Country*, Jack Skiles refutes the most fanciful claims against the judge. Bean threatened to hang hundreds. One or two were even taken to the gallows, then allowed to escape. But rumors to the

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Sorry. Michele Sanders can't talk right now. So she asked us to tell you about her Montero Sport. It's perfect for lugging all her mountain climbing gear. And it's as reliable as her dog, Blue. Although the Montero Sport hasn't chewed up her favorite shoes as of yet.

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contrary, says Skiles, "there's no evidence to suggest that Judge Roy Bean ever hung anybody." And by the way, he adds. This tough man? This hangin' judge? His first name wasn't Roy, but Phantly. Phantly Roy Bean. That's Skiles' rulin', based on Kentucky census records.

Judge Roy Bean stories are like a plant that grows in the Pecos region. Along the Rio Grande, the resurrection plant lies withering on dry rocks. But put it in water, and within a day, it stands tall again. Bean legends, refuted by historians, are watered by our need to believe in Western myth. About 80,000 visitors come to Langtry each year. Tour buses arrive laden with sightseers from Germany, Japan, Slovenia and anywhere else the American West is romanticized. Tourists' most common question is, "Where's your hangin' tree?" Tour guides jokingly point to the remnants of a mesquite tree in the center of town. Its skinny limbs couldn't support a rope swing, let alone a noose, but it makes a good story. "Everyone wants to know how many people he killed, how many he hung," says Sarah Rangel, a Texas state travel counselor based in Langtry. "Some are real disappointed to hear that he didn't hang anyone."

Yet one Bean story, documented and photographed, is as colorful as legend. By the 1890s, as reformers fought to civilize the West, prizefighting had been made illegal in most Western states. Fans were eager for a fight, however, and promoters were eager to dodge the law. A Dallas man, having booked two boxers for a world heavyweight title bout, needed a venue. The fight was first scheduled to take place in Arkansas, but state authorities blocked it. It was to be held in Juárez, but the Mexican governor said he wouldn't allow it. New Mexico was considered as a likely site until Congress intervened, outlawing boxing in all federal territories. By February 1896, fighters, sportswriters and hundreds of fans were hanging around El Paso

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An unfortunate star at Judge Bean's bar was a black bear named Bruno, one of whose charms was that he could drink beer after pulling the cork with his teeth.

waiting to hold the fight *somewhere*. Twenty-six Texas Rangers were on hand to make sure it wouldn't happen in Texas. But then a telegram arrived inviting the entourage down to a tiny town on the Southern Pacific line. Boxers, fans and rangers boarded the train. When it stopped in Langtry, it was met by the "Law West of the Pecos."

On the afternoon of February 22, the Jersey Lilly was packed. Following rounds of drinks for all, Bean led the crowd down the bluff to the [illegible], the river's bottomland beneath towering cliffs. There local laborers had put up a small jerry-built bridge. While Texas Rangers watched helplessly from atop the cliff, the fighters and about 200 fans crossed the bridge and made their way to a sandbar near the Mexican shore of the Rio Grande. In a makeshift ring on the edge of nowhere and nothing, Bob Fitzsimmons fought Peter Maher for the world title. Fitzsimmons made quick work of it, decking Maher with a vicious right after only 95 seconds. Then the crowd followed Bean up the bluff to the Jersey Lilly for more drinks. That night, the entourage returned to El Paso, where sportswriters sent the story around the country. Soon the name of Judge Roy Bean was known far beyond Texas.

By the dawn of the new century, Roy Bean was a tired man. A life of raw adventure had made him older than his years. Yet his legend was being born. In the traditional "Ballad of Judge Roy Bean," the judge smiles "his six-gun smile," and shouts, "By Gobs, gents, . . . that's my rulin'!" In newspapers and dime novels, the myth grew and grew. Bean's saga soon became a part of Texas folklore. In 1936, the Texas centennial fairgrounds featured replicas of Bean's saloon and office. Then in 1940, the judge went to Hollywood.

In *The Westerner*, Walter Brennan played Bean opposite Gary Cooper. Salty, constantly hitting the bottle, Brennan's Bean fights *against* justice, siding with cattlemen in a range war. Cooper, a lone, lean drifter, urges the judge to "be a real judge for all the people!" But Bean burns out homesteaders and hangs anyone who crosses him. When he

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Please Read This Summary Notice:

THE UNITED STATES DISTRICT COURT FOR THE SOUTHERN DISTRICT OF NEW YORK (THE COURT) HAS ORDERED THAT NOTICE BE GIVEN OF THE PENDENCY OF CLASS ACTION AND OF CERTAIN PROPOSED SETTLEMENTS IN "IN RE NASDAQ MARKET-MAKERS ANTITRUST LITIGATION, 94 CIV. 3996 (RWS) (M.D.L. NO. 1023) (S.D.N.Y.)" (THE ACTION).

The Court has certified the Action as a class action on behalf of all persons, firms, corporations, and other entities (excluding defendants and other Nasdaq market-makers, and their respective affiliates) who purchased or sold Class Securities on the Nasdaq National Market, trading directly (or through agents) with the defendants or their alleged co-conspirators, or with their respective affiliates, during the period May 1, 1989 through July 17, 1996 ("Class Period"). The Class includes, but is not limited to, trades through brokers acting as agents. For purposes of this Class definition, the term "Class Securities" refers to 1,659 securities traded on Nasdaq during the Class Period. A list of the Class Securities appears in the Class Notice.

- **If you are and wish to remain in the Class, you need not take any action at this time.**
- **If you meet the Class definition, you will be deemed a member of the Class unless by July 14, 1998 you exclude yourself according to the instructions in the Class Notice.**

If you remain in the Class, then you will be bound by any settlements (including the Proposed Settlements discussed below) and any favorable or unfavorable judgments entered in the Action. The Class is represented by Class Counsel, whose efforts are coordinated by Plaintiffs' Co-Lead Counsel who are: Arthur M. Kaplan, Esq., Fine, Kaplan & Black, A Restricted Professional Company; Christopher Lovell, Esq., Lovell & Stewart, LLP; Leonard B. Simon, Esq., Milberg Weiss Bershad Hynes & Lerach LLP; and Robert A. Skirnick, Esq., Meredith Cohen Greenfogel & Skirnick, P.C. You may enter an appearance through separate counsel, at your own expense.

Plaintiffs allege that the defendants and others successfully conspired to increase and fix the "spreads" paid by plaintiffs and the members of the Class in connection with purchases and sales of Class Securities. The spread is the difference between the bid and the ask price quoted for a security, and allegedly represents a transaction cost borne by buyers and sellers of Nasdaq securities. Plaintiffs seek to recover treble damages for the Class, together with reimbursement of costs, an award of attorneys' fees, and an injunction. The defendants are 37 major Nasdaq market-makers identified in the Class Notice. The defendants have denied all of plaintiffs' allegations and have asserted numerous affirmative defenses. **The Court has not adjudicated, and expresses no opinion regarding the merits of, any claims or defenses.**

Class Counsel have negotiated Proposed Settlements with all defendants, subject to Court approval. The Proposed Settlements provide for aggregate payments which, including interest, will total (before deductions for fees and expenses permitted by the Court) approximately $1,027,000,000.00 by the anticipated time of distribution in 1999. The proposed settlements contain a waiver of rights and broad release of claims, the terms of which are included in the full class notice. **The Court will conduct a Hearing on the final approval of the Proposed Settlements and any petitions for attorneys' fees and reimbursement of expenses on September 9, 1998 at 10 a.m. Any Class member wishing to appear and be heard must submit a Notice of Intention to be Heard, not later than July 14, 1998, according to the instructions in the Class Notice. The full Class Notice is being mailed on or about May 15, 1998 to persons identified by defendants as potential class members.**

Dated: May 15, 1998 Clerk of the Court United States District Court for the Southern District of New York

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As a 1972 Bean, Paul Newman suddenly gunned down everybody in a saloon.

goes to see Miss Lillie in nearby Fort Davis, "Coop" guns him down. He dies backstage at Miss Lillie's feet. Brennan won an Oscar for the role, and the myth was set in stone. Always concerned about the shifting sands of the law, we use Judge Roy Bean to recall a time when justice was firm, if not always fair. In 1956, gravel-voiced Edgar Buchanan played Bean in a weekly TV series. Later the myth became farce in the 1972 shoot-'em-up *The Life and Times of Judge Roy Bean*. As the judge, Paul Newman is nearly hanged when he first visits Langtry. He shoots everyone in the saloon and appoints himself judge. Newman's Bean hangs 'em all before dying in a hail of gunfire, shouting "For Texas, and Miss Lillie!"

Roy Bean was not killed in a blaze of bullets. Contrary to the Larry McMurtry novel and movie *Streets of Laredo*, he was not gunned down by a Mexican outlaw on the steps of the Jersey Lilly. In March 1903, Bean went on a drinking binge in Del Rio. The next afternoon, friends found him wandering helplessly around his saloon courtroom. A doctor was sent for, but it was too late. His Honor died peacefully in bed the following morning. Not much of an ending to a legend, except .

Ten months after Bean passed on

Walter Brennan's 1940 Bean died at Miss Lillie's feet—and won Brennan an Oscar.

to his reward, the Southern Pacific stopped at Langtry. A small ensemble of well-dressed visitors stepped from a luxurious coach. At the center of attention stood a woman, regal, Titian-haired and as beautiful as her picture on the wall of the local saloon. On her way from New Orleans to San Francisco, Lillie Langtry had decided to take the judge up on his invitation. The whole town came out to greet Judge Roy Bean's "someday" sweetheart. Miss Lillie shook hands with grizzled ranchers and greeted women and children dressed in their finest. She set foot in the saloon whose sign still bore her nickname and perhaps even saw her faded picture on its wall. Folks told her stories: how Roy Bean had fined a corpse, freed a murderer, and lined his pockets by shortchanging train passengers. The town's new justice of the peace presented the actress with Bean's pistol and his bear, who quickly fled into the desert. Those gathered gave her some resurrection plants, which she later revived with water. "It was a short visit," Langtry recalled in her autobiography. "but an unforgettable one."

Bruce Watson is a frequent contributor to the magazine. He has lately written articles on Jack London and Ferraris.

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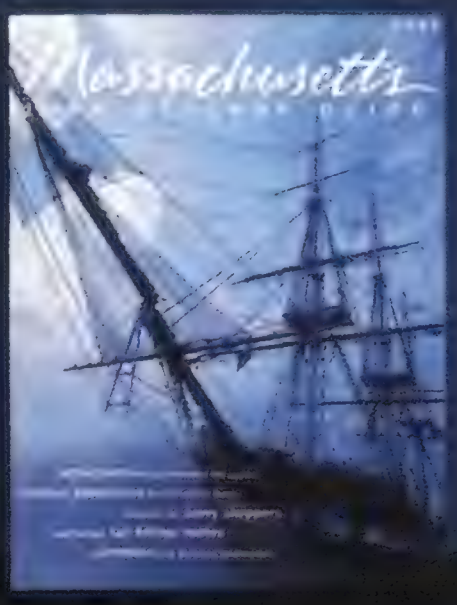

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Bingo Night at the Fire Hall

Barbara Holland

Harcourt Brace, $22

North of Now

W. D. Wetherell

Lyons Press, $27.95

IN 1990, WHILE WORKING FOR A Philadelphia advertising agency and writing on the side, Barbara Holland inherited her mother's summer cabin in the Blue Ridge Mountains of Northern Virginia. Unable to find a buyer for the "one-bedroom, one-bath house without furnace or insulation," and unable to pay her rent in Philadelphia as well as taxes and upkeep on the cabin, Holland made a choice. "I quit my job and gave my landlord notice. I kissed my children and friends goodbye and stuffed my possessions into a U-Haul."

Though Holland's cabin was only 50 miles northwest of the Washington beltway, life was so different in this land of gentle farmers and county fairs, it might as well have been 500. "I had been ripped out of context," writes the author, "and the torn edges continued to drip blood, slowly, for months." Indeed, being an outsider was not easy in a land where "from cradle to grave, my neighbors swing in a hammock of family ties and nobody leaves except for the churchyard."

Though never pushy, Holland was quietly persistent and was rewarded with small victories along the way. Late one afternoon, desperate for companionship, she drove down the mountain to a neighborhood tavern. Finding the tables filled with early diners, she eased as unobtrusively as possible onto a bar stool. "No one is rude," she writes, "but I can feel the subterranean shudder."

Bravely, Holland begins making regular stops at the tavern on the way home from her part-time job writing obituaries for the county newspaper. One day the barmaid nods when the author enters. Months later, when Holland pushes open the tavern door, the barmaid asks, "The usual?" Eventually the men at the bar talk to her. "I am still an aberration," Holland writes, "but no other woman . . . has ever sat at the bar. Only I have managed to claim a stool there where I can look at faces and hear voices after the quiet days." The reader shares her triumph.

"Very slowly I got used to living among people of goodwill and grew nicer myself."

Winters are a true hardship, a time when it's difficult to believe that the nation's capital is so close. Claustrophobia mounts as snow drifts Holland's doors shut and blocks sunlight from windows. The road down the mountain is closed to anyone without a pickup and a plow. Weeks pass with the companionship of only her two cats.

Other than the telephone or the television, theirs is the only conversation she hears for weeks at a time. "Except when the wind

whines, sleet rattles, an owl calls, or a branch cracks under its load of ice," she writes, "the quiet is so intense I can hear the cat breathing." It is a silence "so complete it circles around and turns into something like a sound, a song I could understand if I listened long enough." Eventually her ears "ache with paying attention, straining to hear trees dreaming, foxes walking, stars wheeling, rocks thinking."

Holland survives her lonely winters and grows to love her adopted corner of the world. "Very slowly I got used to living among people of goodwill and grew nicer myself. Remembered to say please and thank you to the waitress and gas-station attendant. Smiled more."

But there is trouble in paradise. The land and the people are being threatened, and Holland's book is as much a tragedy as it is a love story. To the east, houses are thrown up in developments named for what they have replaced—Rolling Meadows, Forest Glen—and on the hillside beneath Holland's mountain home, where peaches once grew, the development-cum-golf course is styled The Orchard. "Of course people do need to play golf," she writes, "but what shall we do for peaches?"

"Maybe I'm supposed to watch what's happening; take notes," she concludes as civilization creeps westward. "End my days as an eccentric holdout from forgotten times . . . reminding strangers of something they don't remember. Maybe I will." With her book, Holland has done just that

W. D. Wetherell made his move to the hills in 1082 when he and his wife "went looking for the perfect town," which they found in rural New Hampshire. Unlike Holland's move, however, which tore her "out of context," Wetherell had long known this was the kind of place—and the kind of life—he wanted. One suspects, in fact, that Wetherell heard the beat of his personal drummer at a very young age.

Like Holland, Wetherell—who sees himself as a "relic of another era, a footnote to an age that not only rushes ahead in heedless bondage to the new, but tramples in contempt on anyone who stubbornly refuses to keep pace"—finds himself bemoaning suburbia's inexorable spread. The newcomers from cities to the south, he writes, "gradually . . . lose patience, revert to type, want pavement and restaurants and instantaneous gratifications." Already, he notes, "on top of the ridges have gone up some astonishingly ugly versions of what trendy owners think a New England house should be."

Both Wetherell and Holland fear they may end up as eccentric cur mudgeons, but where Holland's worried view of the future takes the form of philosophical resignation, Wetherell's view of tomorrow—and much of today—has a pessimistic edge to it: "the very conception of man has changed dramatically in the last one hundred years—and not for the better," he declares.

He scorns computers as writing tools—"the wimpy beeping the world has substituted" for the solid ka-chunking ring of a manual typewriter. Though admitting nostalgia for the TV shows of his childhood, he will not have a TV set in his house today. He frowns upon downhill skiing and notes that "books are rare items to encounter in most American homes."

Such statements, with their hint of self-righteousness, made this reader feel somewhat defensive about her own crowded bookshelves, and a bit guilty about her enjoyment of a first-rate TV show or a fast run down a ski slope. There is much, however, that Wetherell treasures: the memory of his storytelling grandfather, his wife and children, reading, clouds, stars, rivers and trout—to name only a few. Indeed, Wetherell not only

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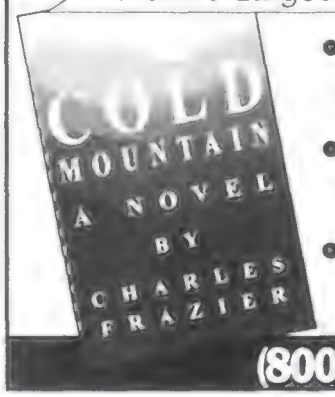

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lives life, he savors it. "If you take your time in small, quiet doses," he writes of his days on the upper Connecticut River, "there are many golden moments to be had yet."

He finds these golden moments and chronicles them in extraordinary ways. He describes "the kind of fog that eats snow, so when we woke up this morning the ground was absolutely bare, as if trolls had opened up hidden petcocks in the earth to suck away the drifts," and tells of "going outside at midnight to look at the way our trees split apart the moonlight" and "a Connecticut [River] as silvery and slippery-looking as a child's playground slide."

At the end of his book, Wetherell informs the reader that his intention has been "to tell the story of a country year from the angle of a man of quiet habits living in an isolated pocket among forgotten and enduring hills . . ." His all-encompassing work does far more than that.

Emily d'Aulaire writes from Connecticut.

The Year the Dream Died: Revisiting 1968 in America

Jules Witcover

Warner Books, $25; $16 (paper)

AS NEWS UNFOLDS DAY TO DAY, MOST years seem historic only in hindsight. But even as it happened, 1968 was recognized by those witnessing it as a watershed.

The drumbeat of events included a frantic Presidential campaign, the roar of Vietnam, two assassinations in two months, student rebellion, riots and cultural upheaval. Topping it all off in December, Americans saw the first pictures of earth from space. There it was, a blue-and-white ball, seemingly serene. "It looks like one planet from here," said an *Apollo 8* astronaut while orbiting the moon on Christmas Eve. Two weeks later, when *Life* ran the earth's cerulean portrait on its cover, the headline proclaimed "'68—The Incredible Year."

In the 30 years since, 1968 has been the subject of novels, films and several different histories. The latest history, *The Year the Dream Died: Revisiting 1968 in America*, offers a month-by-month account of the incredible year. Jules Witcover, longtime political columnist for the *Baltimore Sun*, focuses on the Presidential campaign, but spices his narrative with accounts of the civil rights movement and student unrest. And having covered the campaign as a young reporter, Witcover adds personal anecdotes that offer invaluable insight into this wild year.

January: the onset of the Tet offensive. February: the idealism of Eugene McCarthy's New Hampshire primary campaign. March: President Lyndon Johnson's shocking decision not to seek reelection. April: the assassination of Martin Luther King, Jr. May: the Poor People's March on Washington, D.C. June: Robert Kennedy gunned down. And on it went—one assault after another on the body politic and the culture at large.

Witcover chronicles not just the news but the characters shaped by it. His multi-mirrored narrative, juxtaposing simultaneous stories as they converge, makes even familiar events such as the King assassination seem new and vibrant. He mines the polls and newspaper accounts to reveal the year through the lens of the media, and his use of memoirs, from LBJ's to activist Tom Hayden's, creates a kaleidoscope of personal perspective.

The Year the Dream Died is a superb political chronicle. But election years, especially 1968, are more than the sum of their politics. During this incredible year, culture was reshaping American dreams even as politics was defeating them. Yet Witcover,

essentially a political animal, ignores the year's wild and weird culture.

Art, literature and movies get only a passing glance in monthly chronologies preceding each chapter. Yet this was the year of Stanley Kubrick's *2001: A Space Odyssey* and the ukulele-strumming Tiny Tim; of the counterculture bible, *The Whole Earth Catalog*, and the Black Power manifesto, *Soul on Ice*. Witcover mentions none of these. Even Walter Cronkite's report doubting that the Vietnam War could be won, which LBJ himself recognized as a turning point in public opinion, gets no more than a sentence.

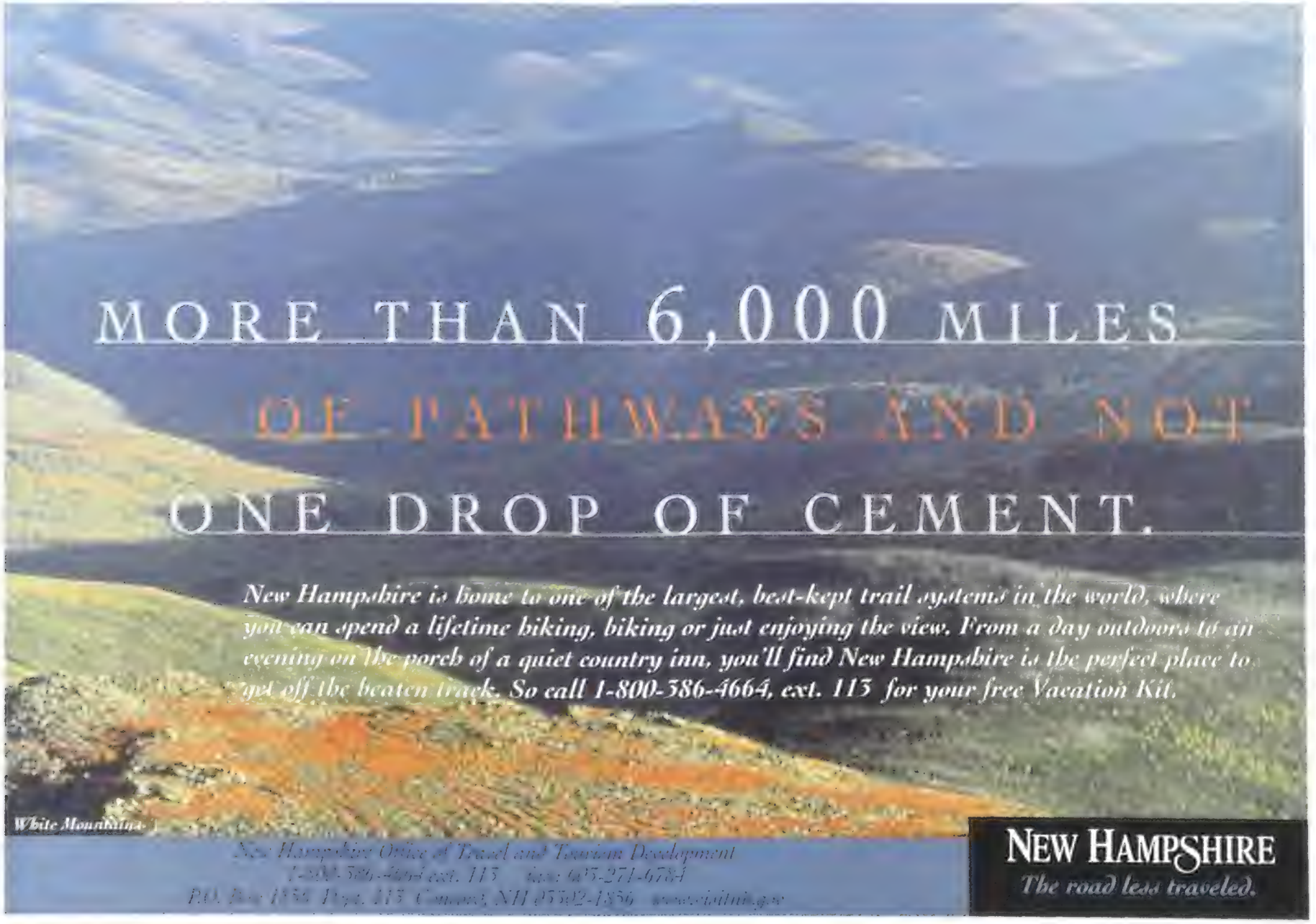
Yet what Witcover's account lacks in cultural context it atones for in a thoughtful epilogue on the year's aftermath. Witcover seems to have interviewed or read the memoirs of every major player. He also quotes current politicians, including Vice President Al Gore and House Speaker Newt Gingrich, who were in college during 1968. Deftly weaving conflicting opinions, he creates a forum on 1968's political repercussions.

Wrapping up this frightening year, Witcover leaves us with suppositions. What if the assassinations hadn't occurred? Could the dream have been kept alive? What if . . . What if . . . Those who remember and those who have only heard about 1968 should revisit it, if only to wonder how we survived it all and how it changed us. For through the lens of hindsight, the final word on 1968 is Winston Churchill's comment on another pivotal year. Speaking of 1914 and the outbreak of war, Churchill lamented, "The terrible Ifs accumulate."

Bruce Watson is based in Massachusetts

PICTURE CREDITS

Jewels of Lalique catalog edited by Yvonne Brunhammer/Flammarion Publishers. **p. 72** Clockwise from left: (Necklace) Metropolitan Museum of Art, Gift of Lillian Nassau; (Hatpin with wasps) Ole Woldbye/Det danske Kunstindustrimuseum, Copenhagen; (Vase) Corning Museum of Glass, NY. Gift of Dr and Mrs Edward Lewison; (Pendant with dancing nymphs) David Behl/Flammarion **p. 73** (Brooch with woman's face) Katherine Wetzel/Virginia Museum of Fine Arts, Richmond. Gift of Sydney and Frances Lewis; (Comb with two swallows and Plaque with two flute players) Flammarion; (Necklace Thistles) André Brumaice/Flammarion; (Chalice) David Behl/Flammarion; (Perfume bottle) Lalique Museum Collection, Paris; (Watch) David Behl/Flammarion.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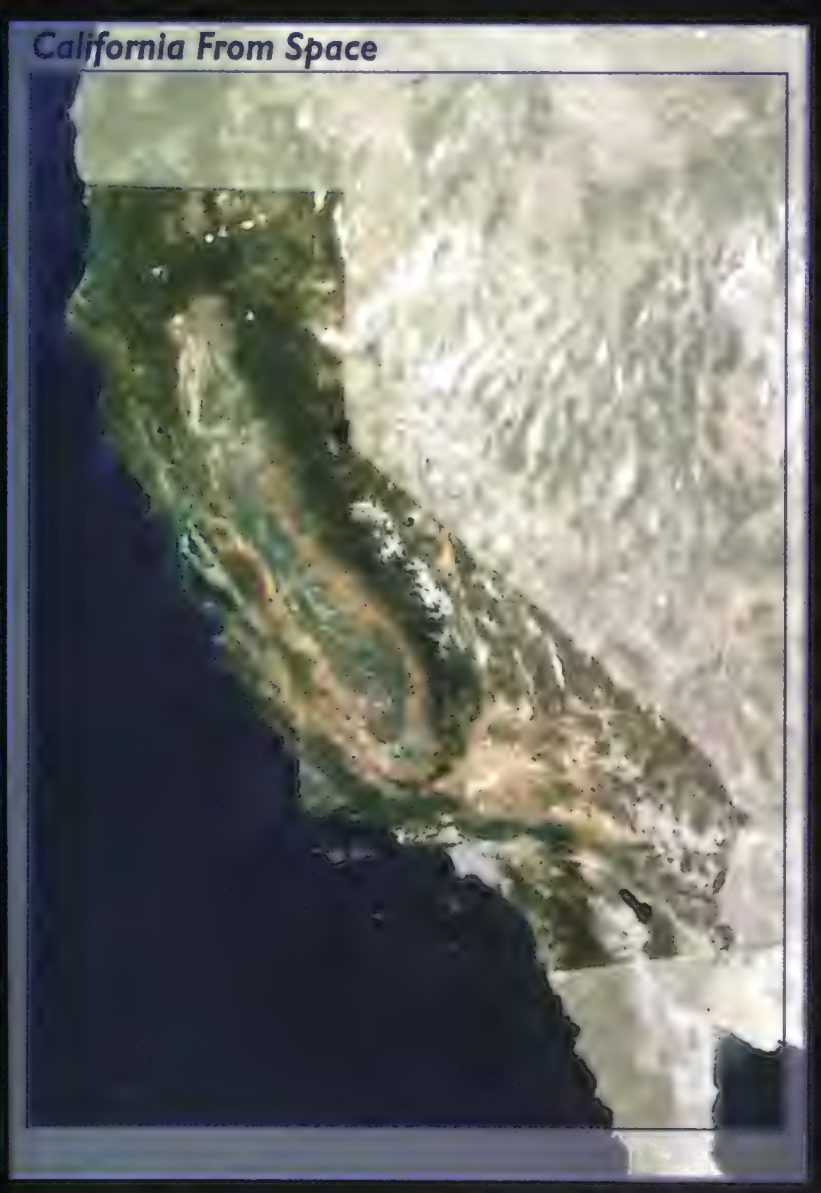

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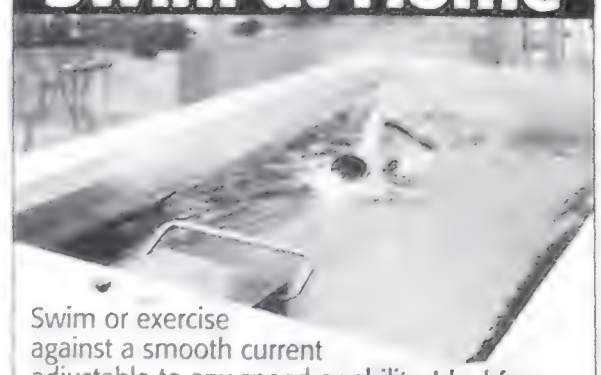

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Danube River Journey (Budapest to Nuremberg, plus Prague) *September 15-28* Aboard the *River Cloud*.

Provence: Cruising the Rhône River (France) *September 18-28* Aboard the *Cézanne*.

Journey of Odysseus (Turkey, Greece, Tunisia and Italy, including Sicily) *September 18-October 2* Aboard the *Clelia II*.

Tuscan Walks (Italy) *September 19-29*

Voyage to Antiquity (Turkey) *September 20-October 5* Aboard the *Sea Cloud*.

Voyage to the Black Sea and Byzantium *September 21-October 3* Aboard the *Bremen*.

Provence: Walks in the Autumn Sun (France) *October 1-11*

Splendors of the Golden Ring (Russia) *October 1-11*

Royal Scotsman (Train Trip through Scotland and England) *October 3-13*

Islands of Indonesia *October 6-25*

Copper Canyon: Mexico's Sierra Madre *October 17-25*

Japan Journey *October 27-November 6*

Folk Art and Celebrations of Mexico *October 27-November 8*

China Insights *November 5-19*

The World of Saint Paul (Mediterranean) *November 6-20* Aboard the *Clelia II*.

Christmas in Prague, Austria's Tyrol Region or Canterbury, England *December*

Kenya Family Safari *December 19-31*

U.S. & Canada Tours

Smithsonian "Anytime" Weekend (Washington, D.C.) Bring your family to see the *Star Wars* exhibit and enjoy the many free activities on the Mall. Packages begin at $222 for two persons for two nights and include a private tour of the Castle, an IMAX film screening and much more.

Oregon Nature and Wildlife *August 8-16*

Canadian Rockies Hiking *August 15-23*

Yellowstone and the Tetons (Montana and Wyoming) *August 26-September 4*

Exploring Greenland, the Arctic and Maritime Canada *August 29-September 11* Aboard the *Clipper Adventure*.

Grand Canyon Sampler *September 4-7*

Long Island Pastoral: Estates, Farms and Cottage Gardens *September 12-17*

Conflict on the Northern Frontier (New York, Vermont and Quebec, Canada) *September 12-20*

Tales of the Whale (Rhode Island and Massachusetts) *September 16-24*

Cape Ann Artists (Massachusetts) *September 24-27* Includes a visit to the Monet exhibition at the Boston Museum of Fine Arts.

NEW! **American Snapshots: Puget Sound (Washington)** *September 24-27* Discover the sound's natural beauty.

Autumn on the Hudson River *September 26-October 3*

Birds of Cape May (New Jersey) and Chincoteague (Virginia) *September 26-October 4*

In the Footsteps of Lincoln (Chicago to St. Louis) *October 12-20* Aboard the *Delta Queen*.

NEW! **American Snapshots: Blackstone River Valley (Rhode Island)** *October 15-* Visit the birthplace of the American Industrial Revolution.

Smithsonian Seminars

Concentrated study of specific topics:

Battle of Little Bighorn (Montana and Wyoming) *August 19-24*

Oregon Shakespeare Festival *August 25-30*

Oxford/Smithsonian Seminar (England) *August 29-September 12*

A Sampling of Learning Adventures for Smithsonian Associates

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aine's Maritime Heritage *September 16-20*

noir, Matisse and Picasso on the viera (France) *September 16-28*

e Wyeths in Maine *September 24-27*

W! Civil War: Campaign for Atlanta *ptember 24-28*

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W! The Romantic Age: Delacroix, ron and Berlioz (Washington, D.C.) *tober 8-12*

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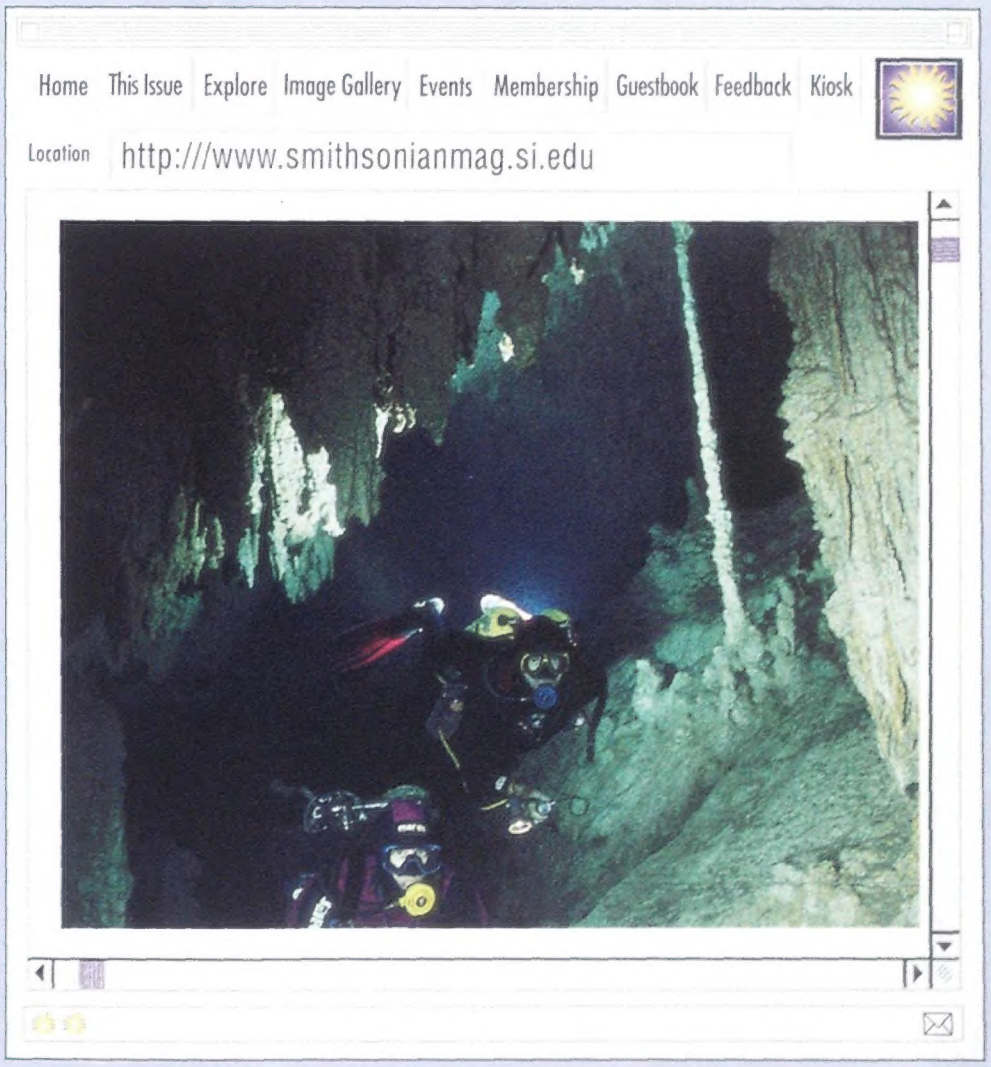

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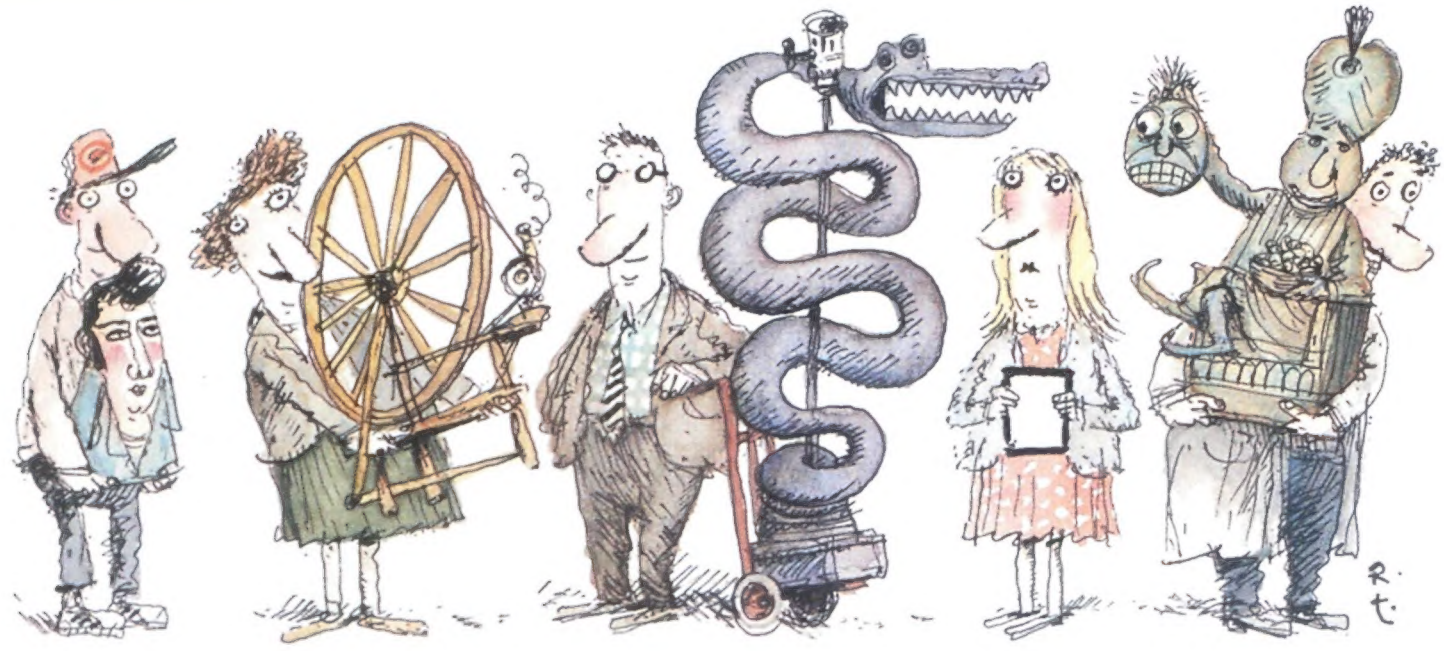
THE LAST PAGE

Prized Possessions

BY MELISSA RUSSELL



I LOVED SHOW-AND-TELL IN kindergarten, but I was pretty sure my teacher, Mrs. Brown, hated it. "Nice story," she would say, "now sit down." I thought about that recently when I took my metal print of M. C. Escher's *Drawing Hands* to a downtown hotel where PBS was taping a segment of *Antiques Roadshow*. This is the program that features people eagerly trotting out things in front of a TV camera that they're reluctant to put on display in their own homes.

I stood in line, hugging my treasure, along with thousands of others who were hugging theirs. We had been lured to the event by the prospect of free appraisals. Inside a fancy ballroom, professionals from Christie's, Sotheby's and other auction houses and galleries were presiding at various "specialty" tables. "Tell me about your piece," they said as, one by one, we presented our prized possessions. After a while it occurred to me that what this was really all about was show-and-tell for big people.

A twitchy man next to me lifted a tarp, revealing a six-foot-tall grotesquerie strapped to a golf cart. It looked like a serpent that had swallowed a string of buoys. "I think it's a lamp base," he explained. "My great-aunt left it to me."

To my left, a man held a carving of a sultan grasping a slave's head. The slave's roll-around eyes looked right at mine.

"She must have loved you very much," I said.

A woman struggled to push a huge spinning wheel. "I hope this is worth a lot of money," she told me. "I have to get rid of it so my husband can have the space for a big-screen TV."

To my left, a burly guy cradled an ornate wood carving of a sultan resting on a divan, eating grapes with one hand and grasping a slave's decapitated head with the other. The slave's roll-around doll eyes looked right at me. Help!

When I entered the production room, I saw a camera crew filming a short, stout woman and her short, stout ginger jar. Nearby, a lady in a hand-knit sweater quivering with three-dimensional flowers held a porcelain tureen that was embellished with molded dragonflies.

The expert at the "drawings and prints" table examined my print. She pursed her lips. "I've never seen Escher's work reproduced quite like that," she said suspiciously.

"But look at the handwriting on the mat," I protested.

"Yes," she replied, "someone has tried to make it look authentic."

"But I bought it at that famous flea market in New York City," I said. The woman was looking over my head at the line behind me. I could feel her searching the crowd for someone with something that would get her a spot on TV. "So what I have," I pressed on, forcing her attention back to me, "is a *limited-edition* forgery, right?"

She nodded. Oh, well. In the back of my mind I could hear Mrs. Brown's voice saying: "Nice story, now sit down."

How Jane sees her dog, Sam.

Big, brown, pleading eyes

Cute little beggar of treats

A hungry boy

A friend who deserves extra rewards

A pal who likes my beef stew

How Jane's veterinarian sees Sam.

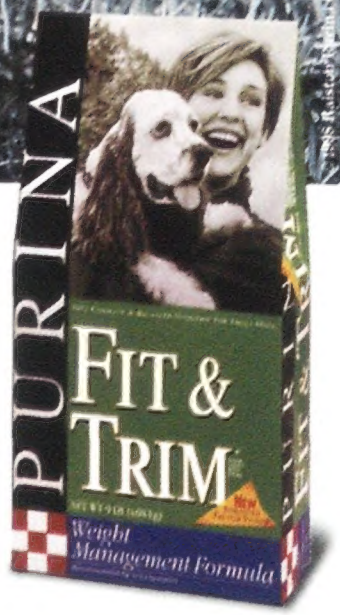
Potential heart problems

Potential respiratory problems

Skeletal stress

Gastrointestinal disorders

A dog who needs Fit & Trim



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